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The Strip Mills of Trumbull Steel Co.

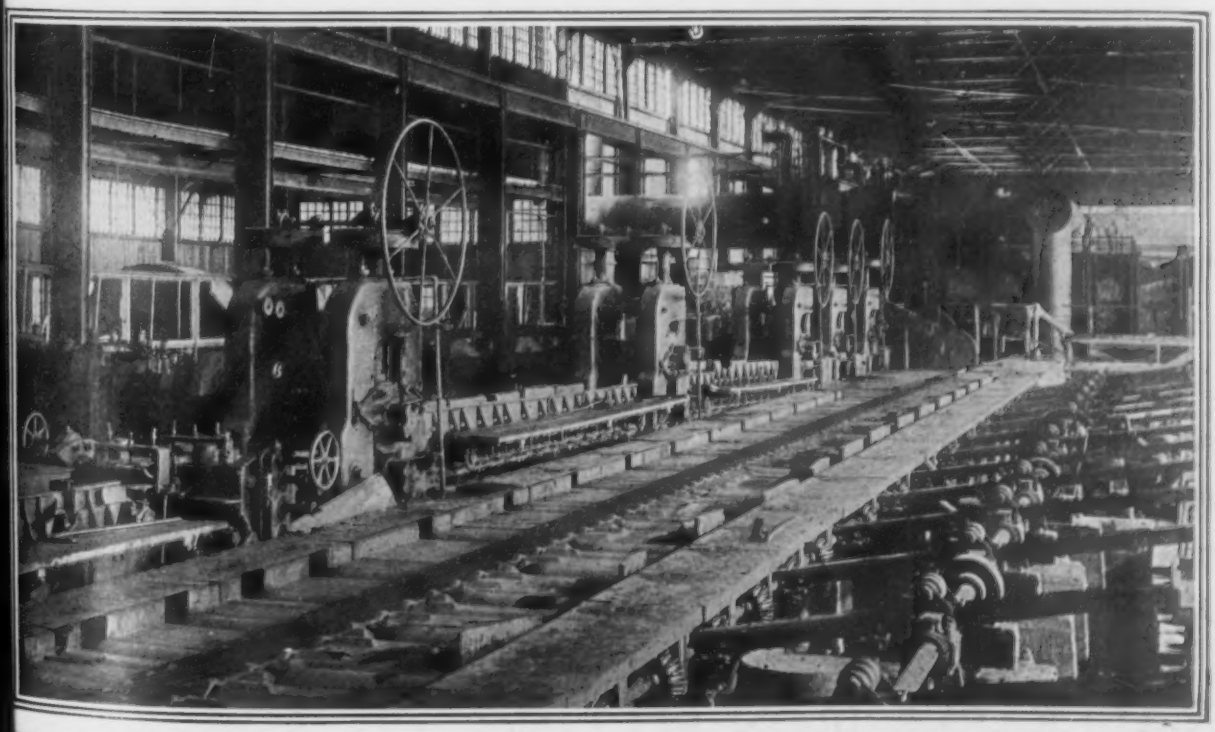
Hot Mill of a Wide Range of Speeds—Interesting Arrangement of the Finishing Stands—Motor Speed Control a Feature

THE Trumbull Steel Co., Warren, Ohio, placed in operation last year a hot-rolled strip mill. It occupies a modern type of mill building, 1000 ft. long and 100 ft. wide, parallel to which is the cold-rolled strip mill building 360 ft. long and 100 ft. wide. Space is provided between the two buildings for a depressed railroad track and loading platform adjoining the hot mill department. Adjoining the lower end of the mill is the pickling department, which occupies a building 100 x 75 ft., equipped with two Mesta standard pickling machines. Hot rolled strip, to be cold rolled, passes from the lower end of the hot mill to the pickling department, and from there to a covered runway to the cold mill department, and the steel is carried in its manufacturing processes through that department in practically a straight line in the opposite direction from that which it takes in the hot mill department. The capacity of the hot mill is about 7500 tons per month, and that of the cold mill department 4000 tons per month.

The hot mill is designed to roll strips 3½ in. to 16¾ in. wide with provisions made to roll at least 20 in. to 22 in. wide and ½ in. and lighter in thickness, special provisions being made for extra wide light strips.

The mill and its arrangement have a number of interesting features and departures from usual practice, including a wide range of speed designed to provide great flexibility and making it possible to change from wide to narrow sizes and vice versa without delays. Roll changes are practically eliminated and the operation of the mill is nearly continuous. No tongued or groove rolls outside of the edging rolls are used. Plain flat rolls are used exclusively in the finishing stands. Various features of the mill are controlled by patents held by H. G. O'Brien, the superintendent of the hot strip mill department.

The lower end of the hot mill department for a distance of 200 ft. is used for a slab storage house. This is served with a 15-ton Pawling & Harnischfeger crane, equipped with a magnet for unloading slabs from railroad cars to the yard and for delivering them to the furnaces. There are two continuous heating furnaces of the gravity discharge type, 41 ft. long and 11 ft. wide, and designed to accommodate slabs 3 ft. to 10 ft. long. The furnaces which were built by Alex Laughlin & Co., Pittsburgh, are fired by producer gas supplied by Morgan continuous gas producers, one for each furnace located just outside the mill building. The



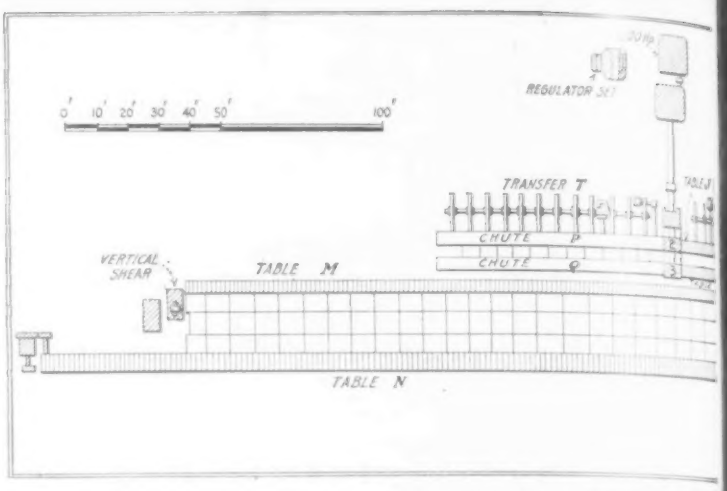
The Five Stands of Roughing Mill, Which Are Driven by One Adjustable Speed Alternating Current Induction Motor. At the side of this mill is a transfer on which the steel is transferred from the No. 4 to No. 5 finishing stand

slabs are charged into the furnace with electric pushers.

The roller table on which the slab is discharged from the heating furnaces is driven in two sections so that only one section is operated when the other is not required. A feature is that they may be reversed, so that should a cold slab come from the furnace it can be run off to the ground at the opposite end of the table and operations can be resumed without delay. Between the furnace and the first roughing rolls are located shears with which extra long slabs can be cut to shorter lengths, depending on the requirements as to the length of the finished strip.

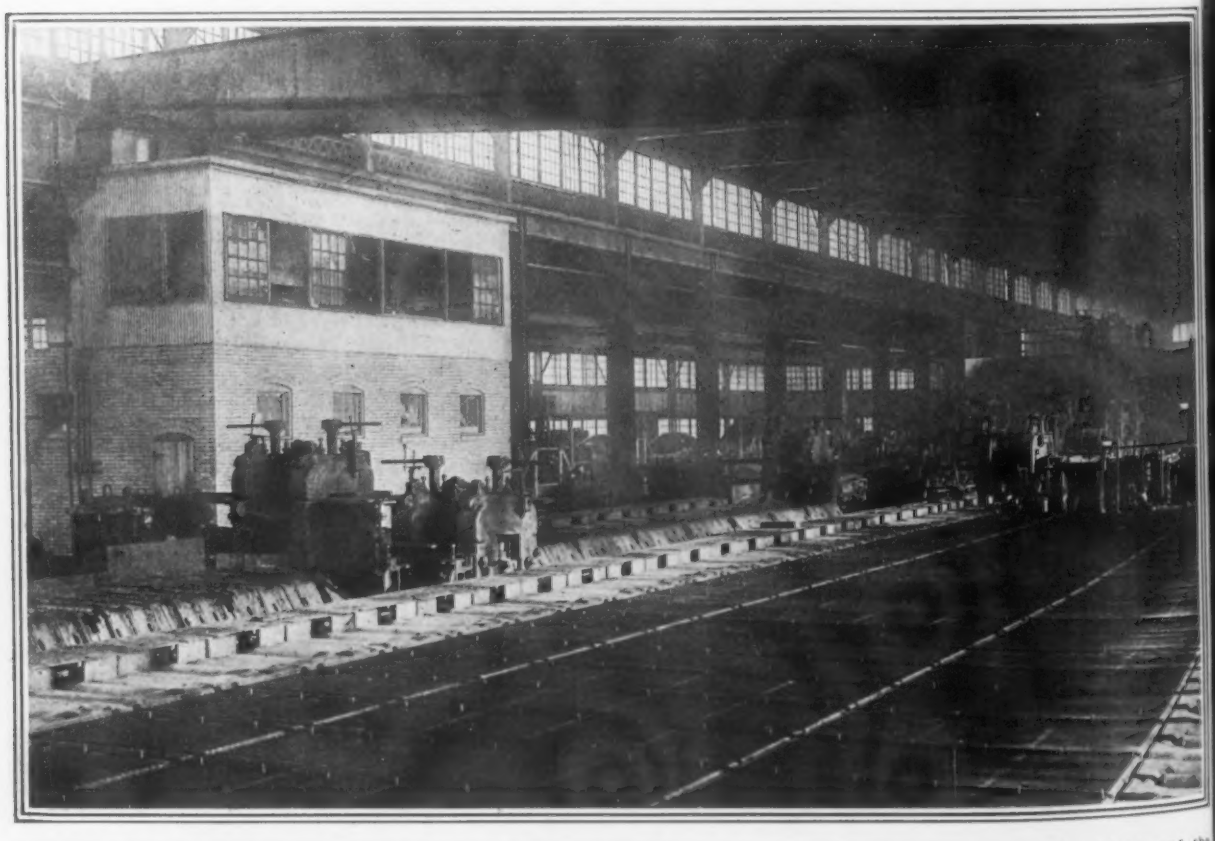
The hot mill consists of a roughing mill of five stands of 20-in. rolls and a finishing mill of five stands of 16-in. rolls. The five roughing-mill stands are driven by one motor. Between the slab shear and the first roughing rolls, which is an edging set, is a table controlled by an operator and driven by a motor controlling the feed to the first edging set. With this exception the control of all the tables in connection with both the roughing and finishing stands is from the pulpit. After shearing, the first piece is released by a lever and passes to the first set of rolls, the second piece remaining behind the shear. When the first piece is out of the way the second piece is released and passes on to the rolls. The strip is rolled from slabs 4 to 17 in. in width, 3 in. in thickness, and 24 in. to 10 ft. in length.

The piece passes through the first set of edging rolls in a vertical position, the rolls accommodating a slab 17 in. wide in this position. The advantage of giving it a vertical edging pass is that the scale drops from both sides. Were the slab edged while lying in a flat position, some of the scale of the top would remain on the surface and would be rolled into the piece during the next operation. After the first edging pass the piece is given flat passes through two sets of rolls. The reduction in these two flat passes is heavy. On leaving the third set of rolls, in which it is given the second flat pass, the

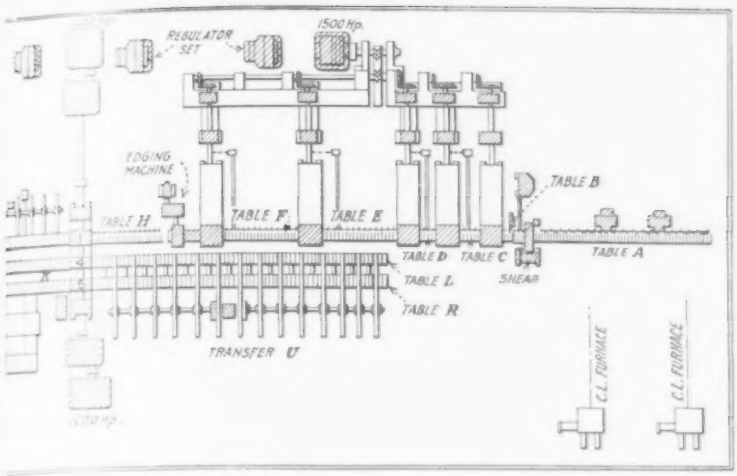


THE HOT-ROLLED STRIP MILL OF THE

The five-roughing stands are all driven from one motor through bevel gearing as indicated. The speed range of the first rolls or edger is about 18 to 30 r.p.m. and the rolls being 20 in. in diameter the mean peripheral speed of the rolls ranges from 94 to 157 ft. per min. Table C, which delivers to the second roughing stand, is driven from that stand by means of a chain drive with a speed reduction which gives a speed of translation to the table of about 100 to 165 ft. per min. The rotary speed of the second stand is 11 to 18 r.p.m., corresponding to a mean peripheral velocity of the rolls of 57 to 94 ft. per min. Table D is also driven, as are the succeeding tables of the roughing mills, by means of a chain from the stand to which it delivers. Table D has a speed of translation of 110 to 180 ft. per min., while the third roughing stand rotates at the same speed as the first or edger, stand. The fourth and fifth stands run at equal



The Two Outside Stands at the Right Are Driven by Separate Motors, One with Higher Speed Than the Other, and the Intermediate Stand May Be Driven from Either of These Outside Stands, Thus Giving It a Wide Speed Range. The transfer in the foreground allows material in heavy gages to be rolled without passing through the stands at the left



TRUMBULL STEEL CO., WARREN, OHIO

speeds ranging from 32 to 53½ r.p.m., but table F is geared for one-sixth higher speed of travel than table E. Table E has roughly a speed of 155 to 260 ft. per min. and table F of 180 to 300.

Of the finishing mills, stand No. 1 is rotated at about 116 r.p.m. when the driving motor is at full speed; No. 5 at 210 r.p.m., while stand No. 3 may be driven at the speed of either No. 1 or No. 5 stand. The rotary speed of stands Nos. 2 and 3 is 175 r.p.m. In all cases the low speed is 60 per cent of the top speed.

Table H leading to finishing stand No. 1 has a top speed of about 400 ft. per min.; and tables J and K 750 ft. per min. The low speeds are about half the high speeds. Tables L and R have a speed of 575 ft. per min. and table M may be run at 800 ft. per min.

bar passes to a roller table which turns it from a horizontal position back to a vertical position in which it is carried through the fourth set of rolls, these being a second edging set. This table works on a pivot so that it can be raised or lowered to accommodate differences in width of material passing from the table to the rolls. After passing through this set of edging rolls the piece falls back into a horizontal position for entrance into the next and last set of rolls in which it is given another flat pass. From these rolls it enters an edging machine where the finished width is controlled.

The rolls of the 20-in. roughing mill are 24 in. wide between housings. They have special housings in which are three separate rollers on each side of the mill rolls in order to handle short cuts of slabs, the roller tables on each side not reaching close enough to the mill rolls to handle 18-in. lengths. The two sets of edging rolls are driven through long spindles in order to permit the raising of the top roll for the vertical rolling. These long spindles permit the raising of the edging rolls 12 in.

The drive from the motor to the mill is through a Francke coupling, double cut helical gears and from a long line shaft through bevel gears to each stand of rolls.

The finishing stands include three stands, side by side, Nos. 1, 4, and 5, the intermediate stand being on a lower horizontal plane, and two additional stands, side by side, Nos. 2 and 3, the latter being in a line with stands Nos. 1 and 4, respectively. The stands have rolls 16 in. in diameter and are 20 in. wide between housings. The finishing rolls are ground and polished on both their necks and bodies.

The bar is rolled to a thickness of ½ to 1 in. in the roughing mill, from which it passes to the first stand of finishing rolls. After leaving the second stand of finishing rolls the piece is transferred from the mill runout table by means of dogs down a slight incline to the parallel approach table to the No. 3 mill, and is taken by a pinch-

Strips to Be Coiled Pass Straight Down from the Finishing Mill on the Runout to the Shear Shown. If the material leaves the plant in flat strips it is transferred to the transfer table and cooling bed to the runout on the opposite side extending beyond the cooling bed and on that runout to another shear

back through No. 3 rolls and from this stand over a roller table to the No. 4 or intermediate stand. From this stand the piece runs onto another transfer table located at the side of the 20-in. mill, and is transferred up a slight incline to the parallel approach table to No. 5 mill, and given its last pass through that mill.

Mills Nos. 1, 4, and 5 are driven by two motors, one located on each side of the mill stands, the other motors together with auxiliary equipment being located in a lean-to opposite the mills. The No. 4 or intermediate stand can be driven either with the No. 1 or No. 5 stand. The drive to No. 4 mill is through the middle and top pinions from the middle and bottom pinions of No. 1 or No. 5 stands, and the drive of No. 3 stand from No. 2 is similarly arranged, the stands having 3-high pinions.

With a higher speed provided for the No. 5 stand a greater range of speed is available for the intermediate stand because of the arrangement to connect it to either of the adjoining stands Nos. 1 and 5 that have different speeds. Between the Nos. 1, 4, and 5 stands, and the Nos. 2 and 3 stands, a transfer is provided similar to that below the latter stands so that when rolling thick gages the material passes only through 1, 4, and 5 stands, the two lower stands, Nos. 2 and 3, being eliminated.

From the finishing mill the product passes to a transfer table and cooling bed, 185 ft. long and 22 ft. 6 in. wide, provided with a ratchet transfer. If the material is to be coiled it passes straight on down the runout table to a vertical shear at the lower end of the transfer where the ends are trimmed off as desired, and it goes from the shear into a coiler. If it is to be shipped out in flat strips it is slowly carried over the transfer and cooling bed to the runout table on the opposite side and carried on a shear approach table 246 ft. long to another vertical shear where it is cut to length and placed on trucks. The runout table to the coiler is divided into two sections, the transfer into three sections, and the runout on the opposite side into four sections, and any one section of each can be operated independently of the other sections. Each section is operated by a variable speed motor.

The electrical equipment of the hot mill consists of four adjustable speed alternating current induction motors for driving the main rolls. These include one 1500-hp. 360-r.p.m. motor, and three 1200-hp. 360-r.p.m. 60-cycle 3-phase 2300-volt mill-type wound-rotor induction motors, the larger motor driving the 20-in. mill and the three smaller motors the 16-in. mill. Each motor is provided with a double range Scherbius speed regulating equipment to give a speed range of 450 to 270 r.p.m. The larger motor has a continuous rating of 1500 hp. from 450 r.p.m. to synchronous speed, and 1200 hp. at 270 r.p.m.

The three smaller motors have a continuous rating of 1200 r.p.m. at all speeds from maximum to minimum. The speed regulating equipment consists of a 360-kva. commutator type alternating-current motor direct connected to a 275-kw. 2300-volt induction generator running at 514 r.p.m. This equipment provides practically a continuous speed range from maximum to minimum.

The commutator motor impresses a voltage on the secondary or rotor of the main motor of such value as to give the desired speed regardless of variations in the load; the main motor, however, retains all the normal characteristics of an induction motor running without speed regulating equipment. When running below synchronism the commutator motor, which is connected to the slip rings of the main motor, operates as a motor and the slip energy of the main motor, less the transformation losses, is returned to the source of supply through the induction generator. When running above synchronism energy is supplied to the secondary of the main motor from the commutator motor which operates as a generator; this energy is obtained from the source of supply through the induction generator which operates as a motor. The speed adjustment is obtained by means of a motor operated field regulator in the field of the commutator motor. This field regulator is operated from a control switch of the push button type located at the operator's stand.

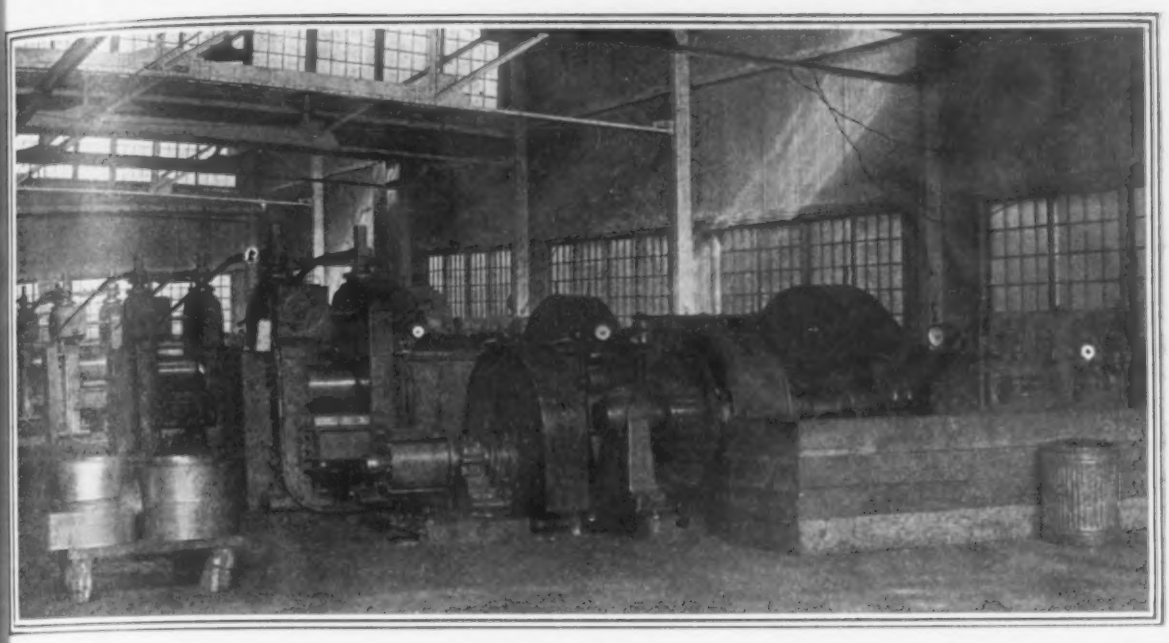
The automatic magnetic starting equipment requires only two operations after the main oil circuit breaker is closed; namely, throwing a compensator switch to start the regulating set and throwing a master controller to the full running position which permits the main motor to accelerate with current limit and automatically inserts the regulating equipment in circuit at the proper time.

The main roll motors regulating sets, auxiliary motors, controls for table, switchboard, and all electrical equipment, were furnished by the General Electric Co. The mills, mill tables, shears and electric pushers for the heating furnaces were built by the United Engineering & Foundry Co. The finished product is handled after leaving the shears on trucks hauled by a Jeffrey storage battery locomotive that runs on tracks in the lower part of the plant and to the pickling department, and to an outside shipping platform. This part of the plant is also served by a 15-ton traveling crane.

The sizes of strip steel produced in the hot mill department range from 3½ to 16¾ in. in width, and from ½ in. thick to any lighter gages. Facilities will be provided for stretching and flattening the strip.

The cold-rolled strip department is designed for the manufacture of strips in a wide range of sizes and for accuracy of product, and among its features is the high operating speed of the mills. This department is equipped with four sets of rolls, 16 in. in diameter and 20 in. wide for rolling strips, 8 to 16 in. wide, four sets of 12 x 16 in. rolls for rolling strips 3⅛ to 8 in. wide, and four sets of 8 x 10 in. rolls for rolling 1 to 3½-in. widths. The four sets included in each unit are arranged tandem, and the three units are located in parallel lines at the end of the plant at which the stock is received from the pickling department.

Arranged in two parallel lines further down the plant and in line with the two smaller units of tandem mills are slitters and finishing mill equipment. There are two single slitters, each of which can be operated either independently or with an adjoining single set of rolls, one with 12 x 16 in., and the other with 8 x 10 in. rolls. In case of further reduction after slitting the material passes directly from the slitter into the rolls, combining the two operations. When the slitter is used independently of the mill and for cutting the steel into narrow strips, six or eight pieces can be slit at one time. Below the two sets of rolls that work with the slitters are two more sets of 10 x 16-in. and 8 x 10-in. rolls, the smaller set being provided with an edging machine. Below these mills are two combination slitters and mills. In these the material always passes from



The 16-in. Mill and the Tandem Arrangement of the Four Sets of Rolls in the Cold-Rolled Strip Mill. Space is conserved by the compact arrangement of the drive

the slitter on through the rolls, and the drive of both is from one motor. On the last finishing rolls strip up to 8 in. wide is rolled down to a thickness of 0.005 to 0.006 of an inch.

The range of sizes produced in the cold rolling department includes strips from ½ to 16 in. wide, and in thickness from 0.375 in. down to 0.008 in. In the lightest gages six strips can be slit in one operation down to a width of ½ in. The strips are cut to a length within 1/32 in. An edging machine is installed for rounding the edges on the strip after it has been slit. The product will include strips, pickled and limed and pickled and oiled.

The rolls are all electrically driven by a motor located in front of the stand instead of at the side, making a compact arrangement. The drive from the motors is through herringbone cut gears. The mills and slitters were furnished by the Waterbury Farrel Foundry & Machine Co., and the motors, which are of the direct current adjustable speed type, were furnished by the Westinghouse Electric & Mfg. Co.

The finished strips are flattened and cut to length in one operation on three electrically driven flattening and cutting machines built by the McKay Machine Co., Youngstown, Ohio. Strip is handled through the plant by means of Automatic Transportation electric trucks.

Adjoining the cold rolled department is the annealing room that occupies a building 400 x 60 ft. This is equipped with six coal fired double chamber furnaces designed by the company. They have air chambers, 4 x 6 ft., and fireboxes, 3 x 4 ft. There are two fireboxes on each side of the furnaces, which are far enough apart to provide coal storage space between. The furnace charge is 40,000 to 50,000 lb. in straight strips, and 20,000 to 22,000 lb. in coils. The furnace charge is loaded upon a bottom and conveyed by a crane to the front of the furnace and placed on large steel balls, on which it is pushed into the furnace after the cover has been placed over the material. The pusher is of a standard crane operated type. The annealing department is served by a 25-ton Morgan electric traveling crane.

At the lower end of the annealing department is a shipping room and adjoining this is an enclosed shipping platform, 240 x 50 ft., which also adjoins the lower end of the cold roll department.

Power for the cold rolling department is supplied by Westinghouse motor generator set consisting of a 750-kw. direct-current generator, and a synchronous motor, and a General Electric set consisting of a 1000-kw. direct-current generator and a 1400-hp. synchronous motor. In the roll grinding department rolls are ground on a Norton roll grinder driven by a 20-hp. motor.

The company's open hearth plant, which will supply steel for its hot and cold roll departments, comprehends seven 100-ton furnaces, and a 36-in. two-high United blooming mill, and an 18-in. Morgan sheet bar and billet mill.

Gas Products Co. Organized

The Gas Products Co., Columbus, Ohio, has been organized and will build a plant for the manufacture of compressed acetylene. The officers are George S. Butler, president; Stanley D. Winger, vice-president and general manager; John R. Gobey, secretary and treasurer. Only recently Mr. Winger resigned as general manager of the compressed acetylene department of the Oxweld Railroad Service Co., Chicago, a subsidiary of the Union Carbide & Carbon Corporation. Before becoming connected with the Chicago company he was manager of the railroad sales and service of the Prest-O-Lite Co., Inc., Indianapolis, previous to its absorption by the Union Carbide & Carbon Corporation. The new company has ample capital and expects to have a thoroughly modern compressed acetylene manufacturing plant in operation within the next ninety days.

The New York office of the Alvey-Ferguson Co., manufacturer of conveying machinery, Cincinnati, which has been located at 4840 Grand Central Terminal for several years, has been moved to the World Tower Building, 110-112 West Fortieth Street, New York, occupying the larger part of the fifteenth floor. The office is in charge of the vice-president of the company, Capt. E. Palmer Bernheim, who has just returned from service overseas in the American Expeditionary Forces.

The recent purchase of 51 per cent of the capital stock of the Howe-McCurtain Coal & Coke Co., Howe, Okla., by L. P. Featherstone, Beaumont, Texas, and associates, was chiefly for the purpose of obtaining a coke supply for the furnaces of the Texas Steel Co. at Rusk, of which Mr. Featherstone is president. The Howe-McCurtain Coal & Coke Co. owns a coal field and 100 coke ovens.

NEW CASE-HARDENING PROCESS

The Shimer Method Employs Cyanamides as a Substitute for Cyanides

A new process has been brought out by Porter W. Shimer, Easton, Pa., for case-hardening steel. Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa., in describing this new method in a paper presented at the New York meeting of the American Institute of Mining Engineers, explained that there are two essentially different types of case-hardening processes. There is the one using a dry mixture in which the object is packed and kept for the necessary time at the necessary temperature, and the other the liquid process employing a bath of fused salts into which the object is immersed and which by immediate contact case-hardens the surface of the article.

The Shimer process belongs to the latter class. It involves the use of a substitute for the bath of melted cyanides which it is claimed case-hardens with equal or greater facility and effectiveness, gives off no poisonous vapors and costs for chemicals but a fraction what the cyanide costs in the previously used baths. The process has been in use over a year in a large American works. The following statement embodies the results of practical experience in the use and operation of the process:

The Shimer liquid or melted bath consists of a mixture of easily fusible salts that do not possess case-hardening properties, into which is immersed fresh calcium cyanamide, which imparts to the bath case-hardening properties. The composition of the non-case-hardening salts appears rather immaterial. Good results have been obtained by using a mixture of sodium chloride, calcium chloride and barium chloride in equal proportions by weight; also a mixture of one part sodium chloride to one part calcium chloride. Potassium chloride can replace the sodium chloride where the question of cost is not material, producing a very liquid bath when equal chemical parts of the two salts are used; that is, 58.5 parts of sodium chloride to 75.5 parts of potassium chloride. Alkaline carbonates or alkaline hydroxides have also been added to the bath material with advantage in some special cases.

The mixture of non-case-hardening salts is melted in an iron or steel pot suitable for case-hardening operations, and the calcium cyanamide is brought into contact with it, which may be accomplished in several ways. One very effective method is to place small lumps of the cyanamide in an iron basket, which is sunk to the bottom of the case-hardening pot. A lively evolution of gas soon takes place, the exact composition of which has not yet been fully determined. The bath quickly acquires case-hardening properties, which last as long as the evolution of gas continues. What the exact chemical reaction of the cyanamide upon the non-case-hardening salts is, to produce a melt that has excellent case-hardening properties, has not yet been determined; it would need thorough and arduous chemical investigation to precisely illuminate the rationale of the operation. The fact remains, however, that contact of the cyanamide with the other salts imparts to the liquid bath active case-hardening properties.

In practice, the calcium cyanamide is immersed in the bath of melted salts and as soon as a lively evolution of gas is shown, the dipping in of articles and their case-hardening can be proceeded with. If the evolution of gas becomes too active, the cyanamide may be removed and case-hardening can be proceeded with for some time after this removal. When the case-hardening power of the bath decreases, the cyanamide may be re-immersed and the operation continued as before. If the cyanamide is in large fresh pieces and the evolution of gas is not too violent, the cyanamide may be left permanently in the bath until it has lost its power of imparting case-hardening properties to the melt, as is shown by the diminution of the evolution of gas. On removing this apparently exhausted material, the larger pieces may be broken, thus exposing fresh surfaces, and the material will be found to still retain active properties when re-immersed in the bath.

It has been found that the cyanamide is best used in lumps varying from the size of a walnut to the size of an egg. It should be in the fresh condition as it is taken from the furnace; that is, it should be kept hermetically sealed until used. If fine powder is put into the bath, it is difficult to keep the powder immersed and the frothing is voluminous and troublesome. If the cyanamide has been exposed to air, absorbing moisture and becoming oxidized, it causes violent frothing when immersed in the bath, which continues an inconveniently long time. If only such cyanamide is available it may be mixed with pulverized hard pitch or with tar and the mass coked at a red heat; this eliminates absorbed moisture and changes the structure from powder to a porous coke. Such porous coke is then used in the melted salts in exactly the way that has been described for solid lumps of fresh calcium cyanamide. Arrangements have been made with the manufacturers of calcium cyanamide to select high-grade cyanamide for the purposes of this process, and to transfer it directly from the furnace in lumps of desired size to air-tight containers, so that its use in the process will always be at a maximum efficiency.

The quantity of cyanamide immersed may vary according to the size of the bath and the shape, size and character of the articles to be case-hardened. A bath may have immersed in it 5 per cent of its weight of the fresh calcium cyanamide, or a corresponding quantity of the cyanamide coke, for ordinary work. Upon removal from the bath, the case-hardened articles are quenched in a suitable cooling liquid as in ordinary case-hardening practice.

A careful estimate of the relative cost of running with the sodium cyanide at normal market prices and calcium cyanamide as described, extending over more than a month's work in a large plant, shows the cost of the bath material to be approximately one-fifth as much when using calcium cyanamide as when using sodium cyanide, with the case-hardening done in an equally satisfactory manner, and with much more comfortable and healthful conditions to the workmen. The question of the scientific basis of the process is being investigated by the inventor.

Spring Meetings of Steel Electrical Engineers

Meetings of the Association of Iron and Steel Electrical Engineers will be held March 1 at both Cleveland and Philadelphia. The Cleveland section will meet at the Hotel Statler and the discussion will concern "Telephones." The Philadelphia section will meet at the Engineers' Club, Spruce Street, Philadelphia, when a paper on "The Substitution of Electric for Hydraulic Power in Steel Mills" will be presented by R. B. Gerhart, electrical engineer, Bethlehem Steel Co., Sparrows Point plant. A meeting of the Pittsburgh section will be held at the Hotel Chatham, Pittsburgh, March 15, when a talk will be given on "The Brass Industry" by W. R. Clark, chief engineer Bridgeport Brass Rolling Mills, Bridgeport, Conn.

Midvale Appoints Division Managers

The Midvale Steel & Ordnance Co. and Cambria Steel Co., Philadelphia, have consolidated their order and shipping department with their general sales department, and hereafter the business formerly handled by these departments will be taken care of by five separate divisions, each division handling the products of customers indicated by the name of the division. These general divisions and the respective managers which have been appointed are as follows: Structural division, manager to be announced later; bar and billet division, L. R. Steuer; forging division, Stuart Hazlewood; railroad division, J. C. C. Holding; distributors division, Edward Price, Jr. These managers will be in entire charge of both sales and orders for products assigned to their respective divisions.

The fatigue of metals is the subject of a paper, illustrated with slides and motion pictures, to be presented by H. F. Moore, professor of experimental engineering, University of Illinois, at a special meeting of the Engineers' Club of Philadelphia, Feb. 15, at the club building, 1317 Spruce Street.

New Way to Cast High Speed Tools

The Davidson Process and Its Advantages Over the Method of Shaping Tools from Forgings—The Structure and Its Effect

A NEW process for casting formed high speed steels is described by J. E. Johnson, Jr., consulting engineer, New York, in a paper, "Davidson Process of Casting Formed Tools," for presentation before the New York meeting of the American Institute of Mining Engineers, Feb. 18. After briefly discussing the results of Taylor and White's invention, this author goes into the conditions and methods involved in the production of formed tools. His conclusions regarding such tools and an abstract of the paper follow:

The production of formed tools by these methods is extremely expensive, for two reasons: First, a large percentage of the weight of the forged blank must be cut away, resulting in chips of fractional value as compared with the value of the forged steel. Second, the labor involved in machining the tool to shape is great in amount and expensive in quality.

Difficulties in Casting Tools

At different times in the last two or three years various people have conceived the idea of casting tools to shape and some progress has been made in this art. It is understood that one large manufacturer has such a process in commercial use. There are three difficulties with this process, from the point of view of ordinary steel melting practice:

That of getting the steel killed so dead that it will be free from blow-holes as cast.

That of producing a metal fluid enough to flow into the fine parts of the mold and give sharp true castings. If this cannot be done, only the rough cuts in machining the cutters are saved and the difficulty involved in cutting the scale may easily offset this gain.

That of producing a satisfactory structure to give great endurance and long life to the steel without the refining of the grain which is often considered to come only from the forging operation.

A year or two ago some tools made by a direct casting process came into the hands of A. C. Davidson. It was soon ascertained that, for the reasons just stated, they could not compete with the older type of tools either in quality or price. Mr. Davidson had previously found that it was possible to kill steel much more completely than had hitherto been possible, and that by the application of his process and his knowledge of heat treatment he could eliminate the defects in cast tools. He therefore began a long series of experiments for that purpose.

In April, 1918, the writer was retained to supervise a test of the process. Mr. Davidson had at that time no works of his own and it was necessary to hire a crucible furnace, which had at one time been used for making crucible castings. This furnace was of poor design and in bad repair, but it was thought that it would serve for a demonstration heat. Ten 100-lb. crucibles were accordingly charged under the inspection of the writer and put into the furnace. One of these was charged entirely with high-speed steel scrap, largely that resulting from previous melts made by Mr. Davidson. This was done with the object of proving whether or not the gates and risers resulting from the casting operation could be worked up in subsequent heats, since the losses that would result would destroy the value of the process if these had to be thrown away.

Comparative Tests with Forged Tools

The conditions surrounding the test were in every way unfavorable and disadvantageous. Nevertheless, a number of milling cutters, countersinks for ship rivets, and forming tools were cast, some of the best of them coming from the pot charged entirely with scrap. Two of the cutters and one of the countersinks were taken from the works by the writer, etched with private identification marks, turned back to Mr. Davidson for annealing, machining, hardening and grinding and were then returned by him to the writer for test.

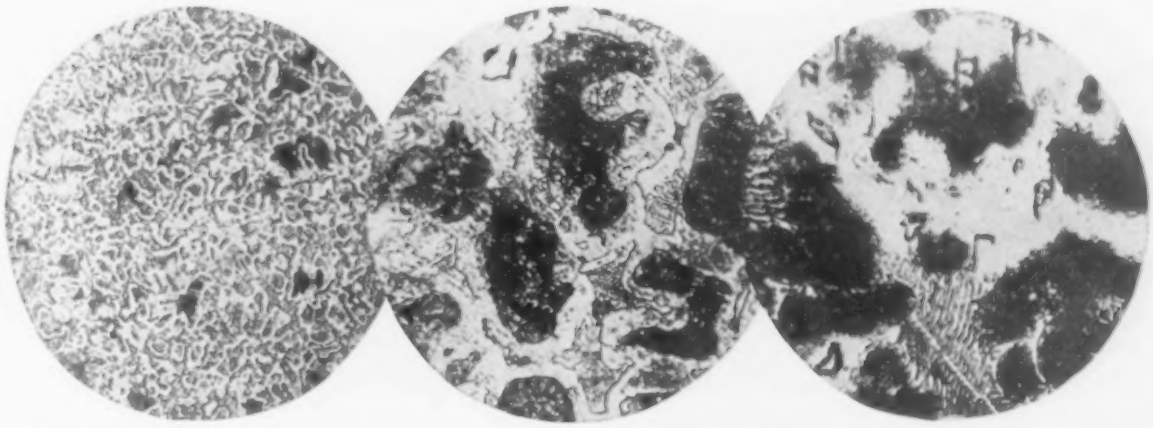


Fig. 1—Section of D. T. M. Cutter from the Davidson Tool Mfg. Co., Etched in 5 Per Cent Nital Solution for 30 sec. × 100.
Fig. 2—Section of D. T. M. Cutter from the Davidson Tool Mfg. Co., Etched in 5 Per Cent Nital Solution for 30 sec. × 400.
Fig. 3a—Section of Tooth from a Davidson Tool Mfg. Co. Milling Cutter, Etched in 5 Per Cent Nital Solution for 7 min. × 400.

In order to have a fair standard of comparison, a Brown and Sharpe side milling cutter of one of the best brands of high-speed steel was bought directly from the works. The tests were made at the Quintard Iron Works through the courtesy of the owners and with the co-operation of the superintendent. The 6-in. (152.4-mm.) by ¾-in. (19.05-mm.) milling cutter contained a number of steam holes caused by wet molds. It was by no means a perfect casting, nevertheless it stood up favorably under the most extreme test that could be given it with the Brown & Sharpe cutter.

A 2½-in. x 2½-in. side milling cutter was then put in the machine and tested at gradually increasing speeds until finally the limit of the machine was reached. The cutter was taking a depth cut like a keyseat in a bar of steel of 0.30 or 0.40 per cent carbon, this cut being the width of the cutter by ¼ in. (6.35 mm.) deep. On the final test the cutter was run at a speed of 400 r.p.m. with a feed of 7 in. (177.8 mm.) per min. This is a linear speed of about 250 ft. (76.2 m.) per min., and, as stated, was the limit of the machine. The cut was run as far as the clamps on the test bar

would permit, and as it was not possible to test the cutter any more severely, the test was stopped and the cutter taken out. It showed no sign of the gruelling test it had been through.

The countersink for ship rivets was turned over to Mr. Milne, the general manager of the Todd Shipbuilding Co., with the request that he give it a thorough tryout in comparison with the best countersinks obtainable. Mr. Milne reported that the countersink compared most favorably with any others that could be obtained.

In spite of the fact that the casting conditions were so bad, the results seemed to indicate the probability that tools could be produced by this process free from blowholes and sufficiently true to form to be finished merely by grinding the cutting edges.

Mr. Davidson was advised to proceed with the commercial development of the process. A small foundry was obtained in Brooklyn, a crucible furnace built, molding machines, etc., installed, as well as machine tools for finishing or partially finishing the product. Production was started in August and has proceeded regularly ever since. At the present time the business has developed so that an electric furnace is being put in for melting the steel which it is expected will be in operation by the time this paper is published.

Many tests have been made of these cast tools against the best of the forged machined tools obtainable in the market, and in practically every instance the cast tools have proved superior to the machined ones, sometimes by a very large margin.

In regard to the process of killing, which not only eliminates the blowholes completely but seems to give the steel a fluidity far beyond that of ordinary high-speed steel, the writer is unable to speak. The material used for killing is a secret of which the writer has no knowledge whatever. It may be said, however, that the results are striking in the last degree.

Fig. 3—Section of Cast High-Speed Steel, Etched in 4 Per Cent Nital Solution for 30 sec. × 100. Fig. 4—Section of Cast High-Speed Steel, Etched in 5 Per Cent Nital Solution for 30 sec. × 400

Features of the Process

The notable features are three: First, the extraordinary freedom from blowholes; second, the fluidity of the metal, and third, the entire absence of coarse crystallization in the casting.

The foundry ran for several weeks before the completion of its baking oven, pouring the steel largely into green-sand molds, and yet made satisfactory tools, there being only a few steam holes near the surface. Since the drying oven was put into operation blowholes of any description are practically unknown.

The metal, instead of having a comparatively ropey pour, is thin and fluid more like good hot cast iron than like steel. As a result the details of small cutters are cast practically perfect.

It is well known that most steel, when cast, has a coarsely crystalline structure, but an examination of the fresh fractures of this steel shows that this is almost wholly absent; in fact, the structure of this steel, as cast, looks more like that of forged steel than it does like a casting.

Structure of the Steel

Photomicrographs have been prepared by Sauveur & Boylston, Cambridge, Mass., which reveal the microstructure of a first-class make of forged and machined high-speed steel, of a cutter made of an ordinary cast high-speed steel, and of a Davidson tool. With these are submitted a statement prepared at my request by H. M. Boylston, of the above firm, which is as follows:

Davidson Tool Manufacturing Co., D. T. M., Cutter.—This was a piece about ¾ in. (19.05 mm.) in section, showing a scale on all sides but one, which had evidently been cut. We prepared the cut surface and photomicrographs, Figs. 1 and 2, represent the structure respectively at 100 and 400 diameters. The structure is fairly fine for a casting and consists of a light matrix in which some polyhedral networks can be indistinctly seen, Fig. 2. Embedded in this matrix are three other constituents; one a dark mottled constituent resembling troosto-sorbite in ordinary carbon steel and resembling also the dark constituent in a cast high-speed steel of ordinary composition or of an ordinary high-speed steel after forging and annealing. The second constituent is a light hard one forming a herring-bone design and is plainly a eutectic of some sort. It is similar in quality but greater in quantity to the so-called carbide envelopes found in ordinary cast high-speed steel. The fourth constituent consists of a series of separate small rounded hard white spots similar to the excess carbide found in an ordinary high-speed steel both before and after hardening, provided the sum of the carbon, tungsten and chromium contents are high enough. The structure of this sample is more like that of an ordinary high-speed steel casting than that of a well-treated high-speed steel after forging, annealing and heat treatment, but it is also clearly different from the structure of an ordinary high-speed steel casting of good quality, in that the dark constituent of a sorbitic appearance is much less in quantity than in an ordinary high-speed steel casting, while the herring-bone eutectic is larger in quantity than is found in the carbide envelopes of an ordinary high-speed steel casting. The ordinary casting, also, does not contain the separate bright white constituents seen in the D. T. M. tool, while the D. T. M. tool apparently has some austenite (the polyhedral grains dimly seen in places in Fig. 2).

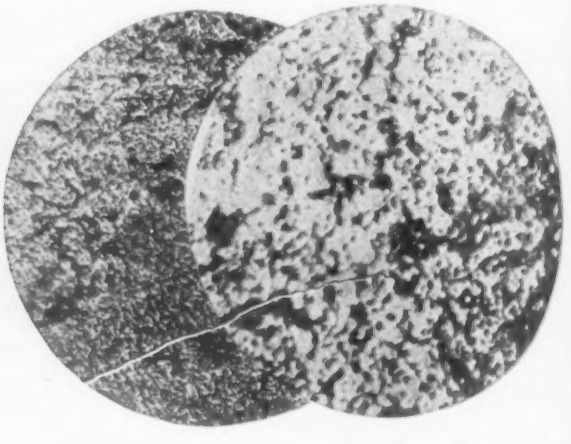


Fig. 5—Section of a Brown and Sharpe Milling Cutter, Etched in 5 Per Cent Nital Solution for 7 min. × 100. Fig. 6—Section of a Brown and Sharpe Milling Cutter, Etched in 5 Per Cent Nital Solution for 7 min. × 400

Photomicrographs of an ordinary commercial high-speed steel casting (from an ingot) magnified 100 and 400 diameters respectively are given for comparison. Figs. 3 and 4.

Commercial Milling Cutter.—The structure of the commercial milling cutter submitted to us is that of a commercial high-speed steel with an unusually large amount of free carbide forming almost complete envelopes in some cases. The background is austenite with some fine markings, which we judge to be due to the tempering process. The structure as a whole is very different from that of the D. T. M. cutter but is characteristic of an ordinary high-speed steel forged cutter that has been heat treated and tempered. There is a dark constituent surrounding the free carbide areas in this sample, which would seem to indicate that the heating for hardening has either been too low or has been continued for too short a time, so that the annealed structure is not entirely obliterated. The fact that the net-

works of austenite are often incomplete and the large amount of free carbide present are additional evidence of this defective heat treatment. While we have called this defective heat treatment, it may not be a very serious matter in a cutter of this size, although we should look for brittleness at the edges of the cutting teeth which are on the periphery of the cutter.

We are not prepared to make any statement in regard to the probable cutting properties of the D. T. M. fragment as compared with the Brown & Sharpe cutter, since it would take actual cutting tests to determine this. The photographs are magnified 100 and 400 diameters respectively, and marked Figs. 5 and 6.

Since the feathery constituent mentioned by Mr. Boylston, and shown in the photomicrographs of the Davidson tool, appears from Mr. Boylston's statement to be rather rare and is abundant in this steel, I am led to think that the surprising quality of these tools may be due, in some degree, to the presence of this constituent. It seems well to point out here, however, that the metallography of cutting tools is not sufficiently developed to enable us to say, even from a good photomicrograph, that a certain tool is definitely good or bad. The science will undoubtely reach a state of development where this will be possible, but for the present the only safe gage of the quality of high-speed steel tools is a test under working conditions, the test to be continued to destruction if possible. Judging from the number of cases in which the cast tools have outstripped all others in such tests, a suggestion not unworthy of consideration is that the structure shown by the Davidson tools is that at which other toolmakers should aim.

Working on a Reduced Basis in the Connellsville Coke Region

UNIONTOWN, PA., Feb. 17.—Belief is expressed by close observers of conditions in the Connellsville coke region that the bottom has been reached in the region's rapid and orderly readjustment to meet immediate post-war requirements of the trade. Unless there are unforeseen developments, there are indications that for several weeks and perhaps months, production in the region will aggregate 525,000 tons coal and 225,000 tons coke. Production at the present time more nearly equals consumption than at any time since the war ended. It is the intention of operators to maintain that equality until conditions become more fixed than they are at the present time.

Plants generally are working upon a four and five-day basis. The H. C. Frick Coke Co. suspended operations for a day this week at a number of its plants, thus joining the independent operators in the curtailment policy. The corporation previously had operated six days but had eliminated all extra shifts. Limited employment for all workmen rather than a reduction in personnel is the policy adopted here to prevent an unemployment problem. Production costs are being pared wherever possible, but so far the wage scale has not been touched. One plant, the Harah Coal & Coke Co., put into effect this week a 30 per cent reduction, but it did not create a ripple in the region. The operation is one of the "war mines." Independent operators are not contemplating any wage reduction and the Frick company has announced its policy not to disturb the wage scale at the present time.

Prize Essay Contest in Industrial Economics

The National Industrial Conference Board, 15 Beacon Street, Boston, offers a prize of $1000 for the best monograph on any one of the following subjects:

(1) A practicable plan for representation of workers in determining conditions of work and for prevention of industrial disputes.

(2) The major causes of unemployment and how to minimize them.

(3) How can efficiency of workers be so increased as to make high wage rates economically practicable?

(4) Should the State interfere in the determination of wage rates?

(5) Should rates of wages be definitely based on the cost of living?

(6) How can present systems of wage payments be so perfected and supplemented as to be most conducive to individual efficiency and to the contentment of workers?

(7) The closed union shop *versus* the open shop: their social and economic value compared.

(8) Should trade unions and employers' associations be made legally responsible?

The committee of award is composed of: Frederick P. Fish, of Fish, Richardson & Neave, Boston, Mass., chairman of the board; Dr. Jacob Gould Schurman, president Cornell University; Henry R. Towne, chairman Yale & Towne Mfg. Co., New York.

The contest is open without restriction to all persons except those who are members of or identified with the board. Contestants are not limited to papers of any length, but they should not be unduly expanded. Especial weight will be given to English and to skill in exposition. The copyright of the prize manuscript, with all publication rights, will be vested in the board. Manuscripts must be mailed on or before July 1, 1919. Magnus W. Alexander is managing director.

A Shear Test for Cast Iron

Testing cast iron by a novel method is described briefly by C. Frémont in *Comptes Rendus*, December, 1918, according to London *Engineering*. Rightly objecting that cast iron tests are generally performed on specially-cast specimens which are not cast and cooled under the actual conditions under which the piece in question has been prepared, Frémont proposes a way of detaching small specimens directly from the piece and of submitting them to a shear test in a new small machine of his design. By means of a trepanning tool he isolates a cylinder, about 25 mm. diameter and 20 mm. high from the actual piece; this cylinder is then detached from the piece with the aid of two center tubes. The specimen thus obtained weighs about 5 grams, against specimens of one or several kilograms weight wanted for tensile and impact tests. The specimen is placed within a block holding a fixed blade and cut by a movable blade which is forced into the specimen by a weight acting on a lever; the force of rupture is estimated from the weight and leverage as traced by a style.

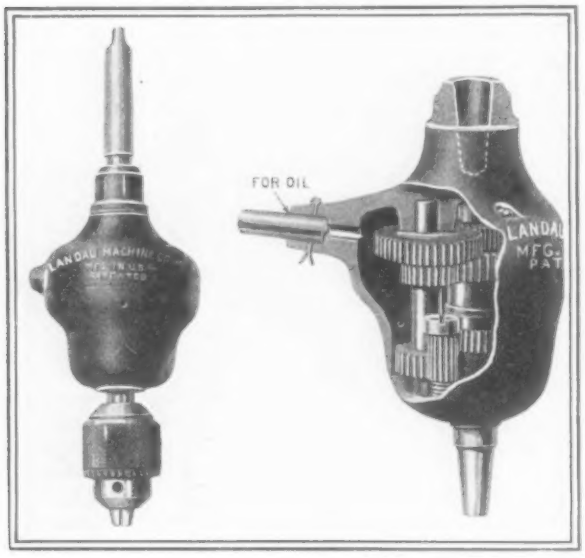
The machine is also recommended for testing cement. Frémont considers that the small weight of his specimen, which can serve for several tests, is a great advantage, and that his shear-test values are the same as those of the tensile strength test while being free from the objections to the latter. His description is not sufficiently detailed, however; he does not give any results, and cast iron can hardly be judged by a few tests of small specimens.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Americas Club in that city Monday evening, Feb. 17. H. B. Kirkpatrick, contract manager of H. Koppers Co., Pittsburgh, delivered a talk on the subject of "By-Product Ovens and By-Product Coke." The talk was illustrated with about 1800 ft. of film, showing the complete operation of the Koppers by-product coke plant. F. W. Speer, chief chemist of the H. Koppers Co., was also present, and answered a great many questions asked by foundrymen as to manufacture of foundry coke and its use in the foundry in order to obtain best results.

The Sharon Steel Hoop Co., Sharon, Pa., has issued a war calendar, printed on heavy embossed paper, on the leaves of which are shown portraits of the military leaders of the United States and the Allies. Other war scenes are also given on the monthly pages of the calendar, making it an extremely interesting publication. Some figures are also given as to the cost of the great world war in men and money, while against these some facts are presented of the stupendous gains of transcendent value to mankind as the result of the defeat of Germany. A complete chronology of the world war is also given.

Back Gear Tapping Attachment

A tapping attachment with back gears has been placed on the market by the Landau Machine & Drill Press Co., 19-25 West Forty-fourth Street, New York. The same principle is employed as is involved in the use of back gears on lathes. The tapping operation is slowed down, thus to reduce the liability of tap breakage and making for rapidity and accuracy of work.



Back Gears in This Tapping Attachment Lower the Speed, Thereby to Reduce Tap Breakage

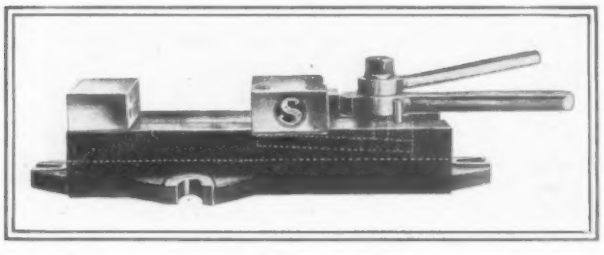
The attachment is adapted for tapping holes to the full length of the tap, or where there are only two or three threads to be cut and the bottom of the hole has been reached, the tap is automatically released from the upper clutch and remains neutral.

The attachment is made in two sizes, No. 1 up to 5/16 in., No. 2 from ¼ in. to 1 in., equipped with standard Morse taper shanks; a positive, sensitive drive to be used from 0 in. to 5/16 in. This back gear attachment is designed for use on a standard drill press and is arranged to decrease the speed 5 to 1. The reversing speed is 7 to 1. The No. 1 attachment is equipped with a No. 1 Jacobs chuck, capacity 0 in. to 13/64 in. for very sensitive work, or a No. 2 Jacobs chuck, capacity 5/16 in., and will take U. S. standard taps.

Quick-Action Vise

A new quick-action vise for general machine shop use has been placed on the market by the Spafford Tool Works, Hartford, Conn. It is particularly adapted for production work, on hand and power milling machines, grinders and such machines as those on which vises and fixtures are used.

The steel parts are made from drop forgings, and bar stock to gages, hardened and ground, and the base is scraped to fit the slide. The jaws are drilled to gages to permit of the loose jaws being transferred



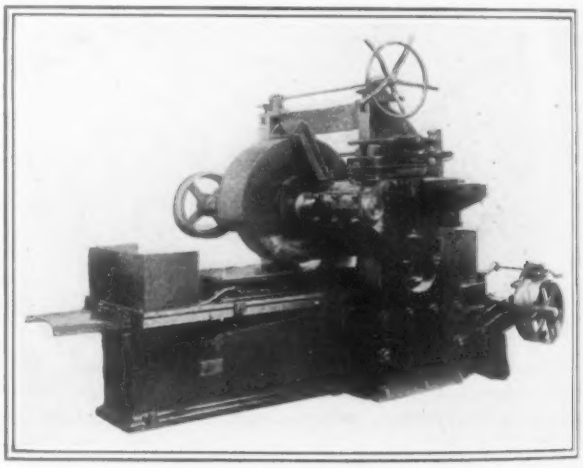
This Vise Is Operated to Grip the Work Quickly and Positively by a Cam Lever and an Eccentric Lever

from one vise to another. The stationary jaw is let into a recess in the semi-steel base to prevent it from changing position, as it might do if simply dowelled on top of the base. The bolt holes for clamping the loose jaw to the stationary jaw are located so that it is convenient to tighten them without coming in contact with the bumper block. The pin which the cam lever works against in opening the vise is so located that when the vise is fully opened the levers slip past the pins, thus avoiding breaking the pin or elongating the hole in the base. The hardened slide is smooth on top, without any serrations for the dirt to get into and wear off, the levers being firmly held in place by means of a bolt in a T slot, the under side of which is on an angle, the bolt head also being on the same angle, thus giving it a wedge shape, which makes it impossible for the bolt to slip back. The sliding jaw is operated by means of a cam lever, which draws it tight against the work, while the eccentric lever gives it a final tightening, thus holding the work securely.

The vises are made in four sizes, 3-in., 4-in., 5-in. and 7-in.

Heavy Duty Oscillating Surface Grinder

The heavy duty oscillating surface grinder, illustrated, was originally made by the Springfield Manufacturing Co., Bridgeport, Conn., for grinding steel lithographing plates, and for this particular work the machine was equipped to grind with a regular sandstone instead of an emery wheel. The manufacturers are now supplying the machine equipped with an emery wheel instead of a sandstone, where the nature of the work demands an emery wheel. The stone on this machine is 36 in. in diameter by 10 in. face. The machine is of heavy proportions and the drive to the table is by means of bevel gears and a screw reversing device the same as ordinarily used on planers. The wheel and wheel spindle are carried in slides, fitted to the saddles on the face of the uprights, and when the machine is in operation the wheel oscillates across the work as it passes under the wheel. This oscillation is



Heavy Duty Oscillating Surface Grinder with Sandstone or Emery Wheel 36 In. in Diameter, with 10 In. Face Grinding 26 In. Wide and 60 In. Long

accomplished by means of a crank and connection on the right hand side of the machine. A lever just above the oscillating connecting rod operates a clutch which engages with the bevel gear, driving the oscillating motion, and this can be connected or disconnected at will, so that the wheel will travel in a straight path rather than oscillate when doing the final finishing. The table is inclosed with guards so as to take care of the splash, and the machine is furnished with or without a magnetic chuck.

The capacity of the machine is to grind 26 in. wide and 60 in. long, and weighs about 13,000 lb.

The Logansport Machine Co., Logansport, Ind., have perfected a line of air-operated chucks, the design of Frederick W. Iggberg. This company, who have in the past manufactured special machinery, will in the future devote its factory to the production of Logan air chucks. The Frank G. Payson Co., 9 South Clinton Street, Chicago, has been granted exclusive selling rights.

Labor Conditions Still Cause Anxiety

Increase of Unemployment Causes Employers to Resist Demands for Higher Wages —Many Threats of Strikes and Lockouts

WASHINGTON, Feb. 18.—Threats of strikes and lockouts throughout the United States have become so serious and so numerous that the Department of Labor is worrying more over them than over the continued increase in unemployment.

From all parts of the country come reports of a particular brittleness in the situation because the increase of applicants for work has made the employers less inclined to deal with demands for higher wages. At the same time there has been nothing to offset the increasing unemployment, for the demobilization of the army continues unchecked. The War Department still refuses to make any concessions to the Labor Department's demands. The cancellation of war contracts is proceeding in accordance with the original program.

The figures given out by the United States Employment Service for the past week show the expected increase in the surplus of workers. The figures now total 321,785 against 290,831 for the preceding week. But this increase of 30,954 is again only an index of the actual increase because it covers less than 150 cities and industries employing only 4,000,000 men.

The percentage of cities reporting unemployment has increased only from 57 to 58 per cent, but this applies only to the number of the cities and not to the amount of the unemployment. The cities reporting demand as equal to the supply has fallen from 32 to 29 per cent.

The same story is told in the employment service register of applications. During the week ending Feb. 1 it received 119,826 applications, of which it succeeded in placing only 77,877. This is 13,101 less than the number placed in the preceding week.

Iron and Steel Industry

The iron and steel industry is credited in the figures compiled by the employment service with contributing to the labor surplus by layoffs in a number of localities. In Ohio the industry is reported as having laid off 1407 men in Cleveland, 396 in Youngstown and 137 in Columbus. In the latter city, however, 34 plants are credited with taking on 1055 employees. Dayton reports five non-ferrous plants as having laid off 204 men. In Pennsylvania, Pittsburgh steel plants laid off 795 men and South Bethlehem 360, while the non-ferrous industries at Erie dropped 331. One steel plant in Chattanooga, Tenn., shut down on account of cancellation of contracts. The iron and steel "layoffs" in Chicago total 303; in Hammond, Ind., 800; and Indianapolis, 600. The unemployment belt has now practically covered the United States, leaving only a few states in the South and among the Northern Central States untouched.

The worst conditions reported come from Ohio, which has a shortage of 100 railroad machinists, 50 railroad boiler-makers, and 100 malleable molders, against a surplus of 100,000 divided as follows: 500 lake seamen, 30,000 building trades, 20,000 semi-skilled laborers, 35,000 common laborers and 10,000 clerks. The biggest unemployment is indicated by the report from Cleveland which has a surplus of 75,000 workers. Akron reports a surplus of 2500; Cincinnati 2300; Dayton 11,000; Toledo 9000 and Youngstown 4700. Conditions in this state have been growing steadily worse.

The situation is bad in New York City, but the Employment Service has made no attempt to compile estimates, and this surplus of workers does not figure in the general figures of the country. This is true of many other large centers, such as Chicago, so that the figure of 321,785 reported is only a partial one.

The Albany district in New York reports a surplus of 5800, which is an increase of 300 over last week. Buffalo reports a surplus of 19,000, an increase of 1000 over last week. Other cities reporting surpluses of labor are Syracuse 5000, Rochester 4000, Utica 2500, Kingston 1000 and Binghamton 500. The cement industries in Albany, Green and Columbia counties report that they are preparing plants for a larger production in the spring.

New Jersey has joined the ranks of the states reporting unemployment. Jersey City, Newark, Passaic, Paterson and Trenton all report a surplus of labor. The northern section is particularly in bad condition, evidently reflecting the New York situation.

The conditions in Connecticut remain approximately the same as shown by last week's report, with the following surpluses: Bridgeport, 7500; Derby, 1000; Hartford, 1500; Middletown, 400; Norwich, 2000; New Haven, 6000; New London, 200; Stamford, 350; Meriden, 1000 and Stafford Springs, 475. The iron and steel and leather industries are still laying off employees throughout this state as well as throughout New England. Reports from Massachusetts show conditions approximately the same as in the preceding week with heavy surpluses in Boston, Lynn and Worcester. The heaviest unemployment seems to be among mechanics and boot and shoe workers. At Lawrence, 24,500 woolen textile workers are on strike. In Fall River many textile workers are on two-thirds time.

Pennsylvania also continues to grow worse. Pittsburgh reports surpluses of 14,100, which is an increase of 5000 over last week. Scranton, which has been reporting shortages, now reports a surplus of 1500. Harrisburg, Philadelphia and South Bethlehem report an equality in labor supply and demand. Philadelphia reports a prospective laying off in the iron and steel concerns of 14,407. Erie reports a surplus of 4100, which is an increase of 1100 over last week.

Michigan a Storm Center

Michigan is still a storm center, although the surplus of 35,000 in Detroit a week ago is reported as reduced to 25,000. This, however, is contradicted by other reports. As the automobile plants are taking no additional men, there seems considerable doubt as to its truth. Grand Rapids, Flint and Port Huron all report surpluses. Jackson reports equality in labor supply and demand. Minneapolis, Minn., now reports a surplus of 7000, which is an increase of 2000 over last week. Duluth and St. Paul are still reporting the demand about equal to the supply. There is a slight shortage of boiler and railroad workers in the state with a heavy surplus of clerical help. Milwaukee, Wis., which last week reported a surplus of labor of 11,000, now reports a surplus of 12,000. Unemployment in Madison, Milwaukee, Superior and Menasha are more marked than in other parts of the state. Racine reports an equality in labor supply and demand.

Illinois now reports that the supply of labor exceeds the demand in nearly all lines, and the unemployment situation is becoming acute. Railroads, however, are in need of locomotive machinists and boiler makers. East St. Louis, Joliet and Rockford all report surpluses. Chicago, Peoria, Rock Island and Springfield report an equality of labor supply and demand, but other reports are far more pessimistic. Indianapolis reports a surplus of 6060, which is the same as last week. Evansville, Gary, Fort Wayne, Hammond, South Bend and Terre Haute all report surpluses. There are threats of strikes or lockouts in Evansville.

St. Louis shows a surplus, and there is a considerable amount of unemployment reported in the State. There has been no settlement of the street car strike in Kansas City.

Kansas City, Kan., reports a surplus of 1000, with new threats of strikes.

The copper situation, with its strikes, makes the conditions in Montana and Butte particularly dangerous because of the pronounced Bolshevist manifestations that have already appeared there. Montana reports a surplus of 18,000 which is an increase of 9000 over last week. Unemployment conditions are general throughout the state, particularly among laborers, ore miners and railroad workers. Arizona reports a heavy unemployment throughout the state, a large number of miners and smelter workers being out of work. Layoffs are continuing in the mining districts.

Louisville, Ky., reports a shortage of about 450, which is a slight decrease from last week. Nashville, Tenn., reports a surplus of 1000, but there seems to be a general equality of labor supply and demand throughout the State.

Baltimore reports a shortage of 500, which is a decrease of 200 from the figures of last week. Wilmington, Del., reports a surplus of 1000. The iron and steel and leather industries are beginning to lay off men. Virginia reports a demand for skilled labor at Hampton Roads, with a slight demand for miners and railroad laborers in the western part of the State. Birmingham, Ala., reports a shortage and Mobile reports threats of strikes and lockouts.

On the Pacific coast, San Francisco, reports a surplus of 7000, which is an increase of 2000 over last week. It also reports threats of strikes and lockouts. Los Angeles reports a surplus of 8500, which is an increase of 500 over last week. Oakland reports a surplus of 4000, which is an increase of 2000 over last week. There are strikes or threats of strikes and lockouts in both cities. Portland, Ore., reports a surplus of 10,500, an increase of 2500 over last week and an increase of 4000 over the previous week. It is thought that the peak of unemployment has been reached in the State, although there is no basis for this view.

Seattle, Wash., reports a surplus of 12,000, which is exclusive of strikes. The shipyards and sympathetic strikes in Seattle and Tacoma district involved 65,000. The heaviest surpluses are reported from Spokane, but no estimate is given. O. F. S.

Should Women Withdraw?

How labor of women affects the present unemployment situation is one of the subjects dealt with by a committee of the Merchants' and Manufacturers' Association, Baltimore, in a report just made.

"A condition which tends to complicate the unemployment probabilities," says the report, "grows out of one phase of the 'women in industry' movement. During the period of actual war activity a very substantial percentage of women entered commerce or industry, not because financial necessity forced them to earn their living, but they did so under patriotic motives. They are reluctant to withdraw. They like the consciousness of earning money. There is naturally much murmuring among the unemployed when they see hundreds of places filled by women whose families are in affluent circumstances while those in need of work are wandering from place to place looking for a job. The question, therefore, presents itself: If these were induced solely by patriotic motives to take jobs during the war, why will not the same lofty patriotism induce them to surrender the said jobs in favor of men and women whose families will go hungry if employment is not found?

"There is one other phase of the problem, somewhat akin to the above. Despite our disposition to quarrel with the man who left his regular work in the summer of 1917 to enter munition and shipbuilding work, we cannot close our eyes to the fact that the public was partially responsible. During the urgent days of the war great patriotic drives were made all over the country for the specific purpose of making workmen understand that it was their primary duty to give up all else in order to promote the rapid making of munitions and the speedy building of ships. His entrance into 'war work' then was not a desertion of old employment, but a response to the cry for help uttered by the nation. That being true, the munition worker and shipbuilder who seeks a return to his old employment is entitled to consideration ahead of the man in uniform who hails from another state. Of course, the returning munition worker or shipbuilder has got to understand that his normal job in normal times is not going to give him the abnormal wage that he enjoyed in abnormal times.

"In these days of intense sensitiveness and inflammability it will be well for industrial employers to understand the value of cultivating a close relationship between themselves and their workers. Unless the relationship is close the situation will open itself to ultimate possibilities more dangerous even than the Bolsheviki movement. It will be an egregious blunder for manufacturers to have labor feel that the industrial world has no interest in labor except to squeeze out of it the largest measure of productiveness at the lowest possible wage."

Improved Conditions on the Coast

SAN FRANCISCO, Feb. 11.

With the breaking of the strike in Seattle the labor situation about San Francisco Bay gives evidence of becoming more settled. All danger of strikes is not yet over, but it is felt that this city and the others about the bay will escape a general strike. The local Trades Council declined to indorse the Seattle strike and has tried to keep its men in line on the compromise agreement with the machine shops including the 48-hr. week. The latter is a point which seems to be resented by some of the unions and they still insist on taking their Saturday afternoons off. As these men took the time off last Saturday their employers refused to pay the agreed installment of the compromise on the retroactive wage dispute. This has again caused hard feeling and may result in a strike of some of the trades. In the meantime on Feb. 10, 1700 members of the Oakland Shipyard Laborers' Union took a "strike holiday" to ballot on a strike to enforce a 10 per cent increase in wages. The officials announce that this ballot resulted in a defeat of the strike proposition. They state that a majority favored the strike, but not the required two-thirds majority. It is believed that the men are beginning to realize that this is a poor time to strike. The announcement that after the expiration of the present Macy award on April 1 the Government would not again fix the wage scale has brought it home to them that the period of Government-fixed wages has passed and that in the future they will have their employers alone to deal with. While the general labor situation may not be said to be stabilized, it does appear much better than for some time past and it may soon vanish as the dominant feature of trade conditions on the Coast.

Americanization at Bethlehem

WASHINGTON, Feb. 18.—The Information and Education Service of the Department of Labor has announced the inauguration of an "Americanization" campaign at Bethlehem, Pa. The announcement declares that the steel company there has in its employ thousands of men representing almost every nationality, and no serious effort has heretofore been made to teach them the English language or anything about American institutions. The presence of a large body of aliens gathered into little groups according to nationality, is not of advantage to the country, in the opinion of officials of the Bureau of Naturalization, Department of Labor, and in order to bring this great army into citizenship, a campaign has been put under way which is already achieving substantial results. Several hundred aliens have already been brought into public schools to receive instruction in English and citizenship problems, and a number of these have already petitioned for naturalization. The Americanization work there, it is believed, will be the preliminary to widespread activity of the same kind in other industrial centers.

The Heat Treatment of Steel Rails During Rolling

A novel method of finishing steel rails and similar shapes is suggested in a patent (U. S. 1,277,372) granted to John Brunner of Evanston, Ill. In present practice a tendency toward coarseness of structure or crystallization in the inner part of the rail head is mentioned, the practice resulting in low ductility in this portion of the rail and making more likely sudden fractures. Various methods of heat treatment have been suggested to overcome this tendency.

The method, suggested by Mr. Brunner's patent, is based on the theory that when a rolled article is allowed to cool below the temperature of recalescence a certain grain structure is formed which may be changed to a new grain structure if the article is reheated to a point above the thermal critical range. This is well known, but a new and advantageous result is claimed if, after a finer grain has been obtained by reheating to a point slightly above the thermal critical range, it is re-rolled to the finished size and then slowly cooled to atmospheric temperature, thereby producing an article of uniform fine grain with a hard exterior finish.

In practice the method comprises the steps of rolling the rail to a size slightly in excess of that of the finished rail, allowing the rail to cool slowly to a temperature below that of recalescence, then reheating the rail slowly and evenly to a temperature slightly above the upper limit of the thermal critical range, until the structure attains a fine grain, then re-rolling the rail, or in effect giving it the final pass or passes, then allowing it to slowly cool on a hot bed. Preferably before being received on the hot bed the rail may be passed through straightening and cambering rolls.

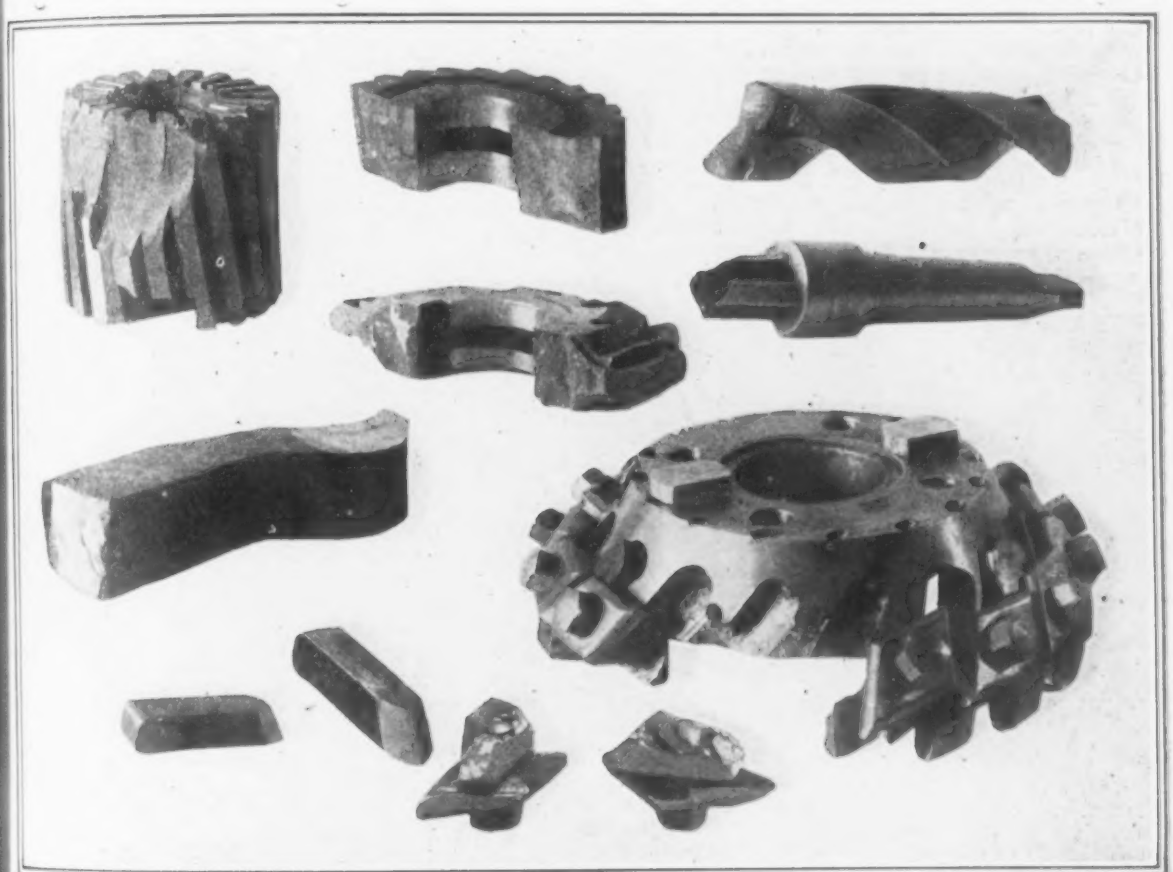
Rails produced in accordance with this method are said to have a finer and more uniform grain structure throughout the cross section; to present a better finish than is possible to obtain by the present methods, and to have greater ductility, both in the head and in the web, than is found in the present rails. The wear and breakage resistance will be materially increased.

HIGH COST OF TOOL BREAKAGE

Shop Operations Interrupted and Overhead Costs Increased—Tool Damage Reports

To reduce tool breakage, a complete record of each broken tool is kept by the Willamette Iron & Steel Works, Portland, Ore. When the tool is turned in, it is accompanied by a tool damage report which must be turned in at the same time to obtain another instrument. This report also explains the cause of breakage and is sent to the machine-shop superintendent's office each day, where a record is kept of both tool damage and the division of cost against each shift and department.

The records are a convincing testimony to the expense of putting good tools in the hands of careless or incompetent workmen; and a charting of tool breakage shows that it is particularly heavy when numbers of new men are being put to work. Even in normal times the company found that the damage to tools is a big problem and that careless men can destroy in a moment tools far in excess of the value of their labors for weeks and months. It is stated that this actually happened on one or two occasions at the plant. But greater than the loss in money is the fact that it is in some cases almost impossible to replace at once many special high-speed tools that are destroyed. Breakage, therefore, of several important implements at about the same time compelled the plant to lay off a machine and hold up the entire progress of production. The amount of supervision necessary over such incompetent men is shown by the following figures. Before labor turnover became a problem last fall, two tool room clerks with eight assistants easily dispensed the equipment required by 500 men, whereas toward the end of the year 39 were required and 11 men were engaged solely on grinding the tools.



The Fate of Good Tools in the Hands of Careless and Incompetent Workmen: Upper left hand, end mill, cost $60; upper center, keyseating cutter, $18; below, 1¼ O. P. gear cutter, $90; at right, 13/16-in. plate reamer, $8.25; left center, 1½-in. planer tooler, $30

The Pulverized Fuel Equipment Corporation is now the name of the Locomotive Pulverized Fuel Co., 30 Church Street, New York.

YOUNGSTOWN SHEET & TUBE CO.

President Campbell Makes Full Report on Operations of the Past Year

The annual meeting of stockholders of the Youngstown Sheet & Tube Co. was held in Youngstown, Ohio, Tuesday, Feb. 11. A brief report as to operations and earnings of the company in 1918 was published on page 464 of THE IRON AGE, issue of Feb. 13. James A. Campbell, in his report of operations of the company for the year, said that the representation plan of employees was agreed upon by representatives of the management and delegates elected by the men, the purpose, as stated in the preamble, being "To provide effective communication and means of contact between the management and the men on matters pertaining to industrial relations, and to insure justice, maintain tranquillity and promote the common welfare."

"It is the expectation," said President Campbell, "that under this plan every wage earner in the employ of this company shall receive, as we have always intended that he should, exact justice in all matters concerning his relations with the company. Although it has been in operation for only a short time, the results so far abundantly justify the belief that it will fully accomplish this end."

Shipments and Sales

Shipments for the last year were about 35,000 tons less than during the year 1917, owing to the severe weather in January and February, which affected the transportation facilities, and to the loss of business at the end of the year on account of the signing of the armistice on Nov. 11. Total sales were about $5,000,000 less than during the preceding year, due to both a reduced tonnage and price control by the Government. The reduction in earnings, however, was occasioned not so much by loss of tonnage and lower prices as by the increased price of many commodities which the company was obliged to purchase, and especially by advances in labor costs.

There were three advances in wages paid to labor during the year—on April 16, 15 per cent; on Aug. 1, 10 per cent, and on Oct. 1, approximately 14 per cent, the last advance being brought about by the 8-hr. basic day, granting time and a half for time beyond eight hours. These wage advances were occasioned by the higher cost of living and the higher wages paid by the Government in shipbuilding and other war activities. The payroll for the year was $22,157,000 on a reduced tonnage, as compared with $16,396,000 for 1917.

Construction

On June 17 the 84-in. tandem plate mill was put into operation and produced about 70,000 tons of plates during the remainder of the year. On Aug. 8 the company put into operation one new battery of 51 by-product coke ovens, and on Sept. 4 a sixth battery, bringing the number of ovens in operation to 306. Sufficient coke is now being produced to operate all of the blast furnaces and Bessemer cupolas. The new locomotive repair shop, with a capacity for repairing and maintaining 26 locomotives and 14 steam portable cranes, all of which are used in the operation of the plant, has also been completed.

About $12,000,000 has been expended during 1918 in additions to the plant, in the development of coal property, and in building houses for the employees.

The Continental Supply Co., a subsidiary owned by this company, has had a prosperous year, its total sales amounting to $16,823,000. During the year this company marketed 59,651 tons of pipe through its 33 different stores. No dividend has been received from it as yet. In addition to handling the parent company's pipe, it deals in boilers, engines and all kinds of oil well supplies.

Production

With the completion and operation of the bar mills and plate mill finished products were further diversified, there now being a plant capable of producing 1,250,00 tons of coke, 1,000,000 tons of pig iron, 1,500,000 ton of steel ingots, and 1,000,000 tons of finished produc per annum. Further developments of coal minin operations will render the company practically self contained, both as to finishing capacity and a supp of its own raw materials, such as coal, coke, ore, lim stone, etc.

Up to the signing of the armistice, on Nov. 11, th plant was operated under the direction of the Wa Industries Board, the entire output having been pledge to the Government for war purposes.

"In this connection," said President Campbell, " wish to pay a tribute to our employees, particularl those of the operating department, in which condition during the last year and a half have been very tryin The congestion of the railroads, the poor quality an inadequate supply of fuel, the embargoes on shipment for one cause and another, and the severe weather con ditions during the winter of 1917-18, made it a ver difficult matter to successfully operate a plant of suc capacity as ours. It has sometimes been a myster to me how our mills could be made to produce th tonnage they did during these times and at the sam time maintain quality in the face of the difficultie encountered and the poor fuel available. Only by th loyalty of our employees and the faithful and unremit ting efforts of everyone in the operating departmen was such a result made possible.

"Aside from the energy and efficiency shown by th results in our operating department the men and wome employed in our plant contributed most creditably t the national cause through their subscriptions to variou funds for war work and also to the various issues o Liberty bonds. In the fourth Liberty loan the numbe of subscribers was 12,956, and the amount of thei subscriptions $3,423,050—an average of $264.20 eac For the period of the war this average was $5 each, and the total amount of bonds bought wa $6,179,400."

President Campbell said the company cannot hop to earn adequate profits during the reconstructio period, and its greatest concern is to provide fairl steady employment for its workmen during this perio To do so it will distribute employment as evenly a may be possible, in order that all employees ma share in whatever work may be availale.

The company has not set aside anything for Federa taxes, as the new revenue act had not been passe when this report was written. These taxes may amoun to between $8,000,000 and $10,000,000 and their pay ment then will absorb the earnings in excess of regula dividends.

The Influenza Epidemic

About $35,000 was expended to combat influenz Free vaccination was offered to all employees and mem bers of their families. Among the 5072 persons vacc nated only 35 cases of the disease occurred, and non of these was fatal. On the other hand, among em ployees and their families who could not be induce to avail themselves of this protection there were 35 cases of influenza, resulting in 43 deaths. Four specia hospitals were organized and equipped by the medica department, one each at East Youngstown, Struthers Hubbard and Nemacolin, and all of these except th at Struthers, which was taken over by the villag authorities, were operated by the company during th time that they were needed.

The statement of earnings follows:

Earnings from operations		$24,675,580.6
Earnings from investments		1,276,538.6
Total earnings		$25,952,119.2
Less depreciation of plants	$2,500,000.00	
Less adjustment of inventories	1,499,256.36	
Less adjustment in cost of construction for war purposes and other misc. adjustments	7,363,373.75	11,362,630.1
Net profits for year		$14,589,488.9
Less dividends paid		4,394,721.6
Net surplus for year		$10,194,767.2

A New Method of Gang Drilling

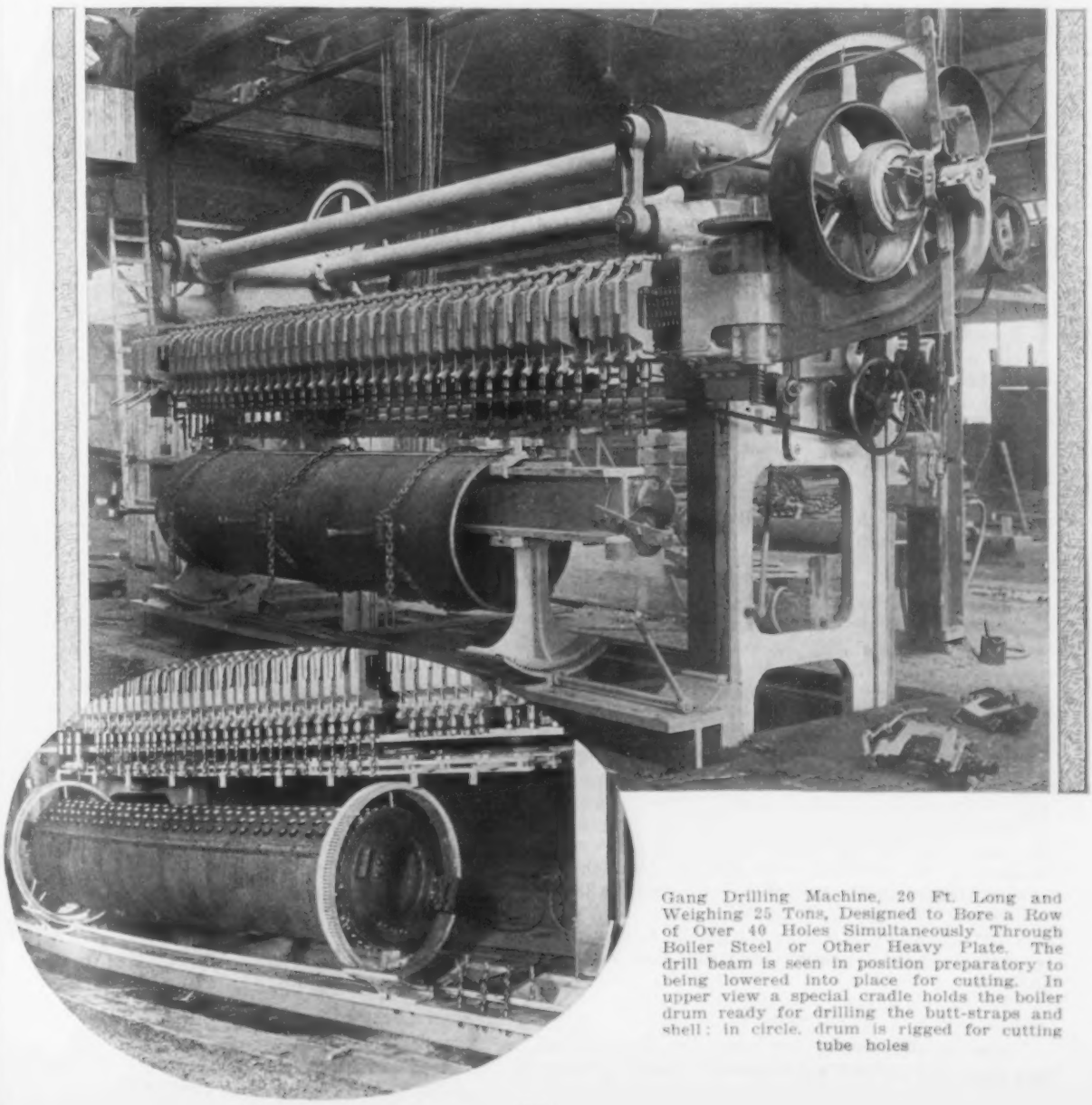
Radical Design Based on Detachable Drill Heads and Chain Drive—Cutting Cycle Automatic—Application in a Boiler Shop

A GANG drilling machine of unusual design especially adapted for boiler shops, structural steel fabrication and ship-plate work has been built by the Hilldrill Co., 2141 North Nineteenth Street, Philadelphia. The drill spindles are chain-driven, and by virtue of the almost direct application of power, require a comparatively small horsepower consumption for the operation, enabling great latitude in the number of drills driven. The flexibility and strength of the chain drive also makes for a machine that is adaptable not only for heavy duty, but for gang drilling on any type of work. The cycle of operations in the actual drilling is automatic and the spacing of the spindles is universal, above a minimum, which on the heavy-duty type here shown is 2¾ in. centers. This spacing may be cut in half by shifting the work.

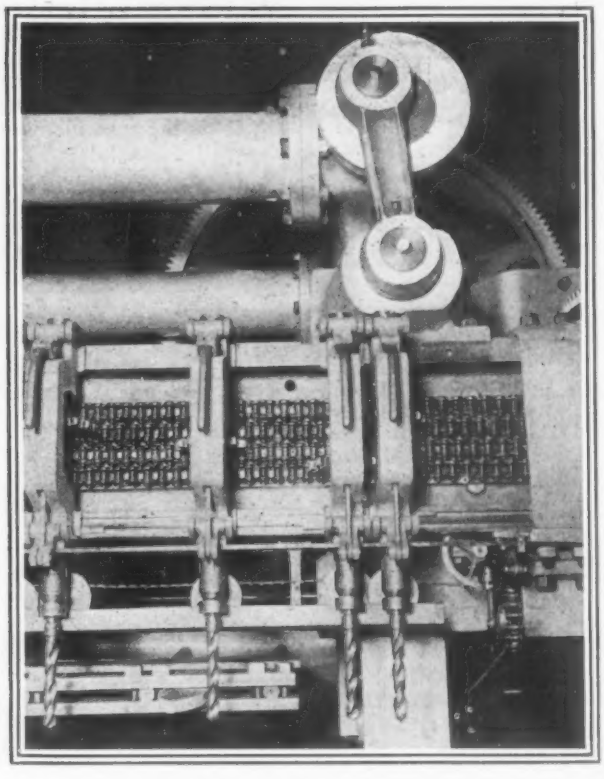
The application of chain drive for drilling is the basic feature of the machine, which has been designed by Aaron Hill, 1028 West Forty-eighth Street, Los Angeles, Cal. The invention gives virtually a direct pull on the spindles and is found to eliminate power losses or chatter. On ⅞-in. boiler plate, drilling 44 1 1/16-in. rivet holes through plate and ½-in. inner and ½-in. outer butt straps, about 11 hp. net was required. The spindle sprockets engaging the chain are staggered, to distribute the load over the several chains provided; and the web of the drill carriage forms a lubricated runway for these roller chains and serves to prevent the chain from slipping off the sprockets.

The mechanism clamps the work in place with a pressure of about 10 tons, sufficient to straighten any ordinary sweep or buckle, feeds and lubricates the drills and at the end of the cut raises the drills, stops both the drills and lubrication and releases the work, all automatically.

A radical departure in drill design are the drill heads, built as independent detachable units. Each unit consists of a small bridge casting which straddles the chainway and is machined at each end to slide easily along the carriage rails. At the top and just above the spindle socket are hinged clamps operated by levers linked to the adjusting handle. In placing the unit in position on the carriage seats the clamping device is only partially tightened. The spindle is then



Gang Drilling Machine, 26 Ft. Long and Weighing 25 Tons, Designed to Bore a Row of Over 40 Holes Simultaneously Through Boiler Steel or Other Heavy Plate. The drill beam is seen in position preparatory to being lowered into place for cutting. In upper view a special cradle holds the boiler drum ready for drilling the butt-straps and shell; in circle, drum is rigged for cutting tube holes



Mechanism in the Starting Position, with Disk Crank (Upper Right) Just Past Upper Dead Center. Flexibility of design is typified by various spacing of drills and staggered sprocket gears driving spindles. Disk lubricators set behind spindle sockets are oscillated by link chain tied to quadrant wheel (lower right)

racked into position by rotating the spindle by means of a loose lever inserted by hand in a drift hole in the spindle socket. Racking the spindles to correct centers is facilitated by means of a steel tape stretched across in front of the spindle heads. The units, weighing from 45 to 65 lb., are easily handled by man and helper, and the entire gang can be set in about 8 min.

The accepted practice in drilling calls for higher speed and slower feed the smaller the diameter of the drill. This principle is automatically taken care of without changing feed or speed on the machine proper, but by corresponding differences in the design of the various size units. For example, a unit designed for a No. 3 socket, taking up to 1¼-in. drill, is equipped with a 10-toothed sprocket turning up to about 160 r.p.m., with an average feed of 0.004, while the unit for a No. 5 socket holding 3½-in. cutters is equipped with a 20-toothed sprocket turning 80 r.p.m. and feeding at an average of 0.008 per revolution.

To start the cutting cycle, the motor is started and the clutch thrown in. In the starting position the disk cranks hold the carriage just past the upper dead center, so that the initial drill feed is a minimum, in the first stages approaching a maximum of 0.005 in. per revolution passing through the body of the work and automatically diminishing to about 0.003 in. at the break-through. This variable feed safeguards the machine against shocks and minimizes losses from breakage of drills by "hogging" on the break-through.

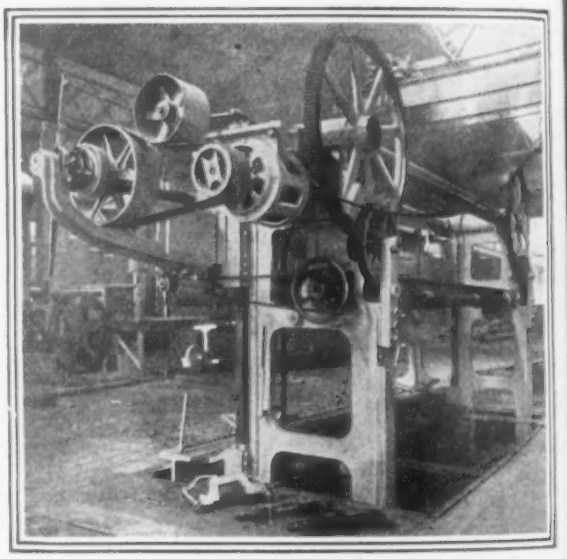
The drill units are locked into place by bringing the adjusting handle down tight, forcing the clamps home into grooves in the cross-rail. Keyways cut in the face of the lower seat and staggered serve to prevent any tendency on the part of the units to cock over while being racked into position. The drill heads are likewise alternately staggered, so as to insure a close setting where required.

During the return to starting position, a small cam on the hub of the large gear at the driving end operates a lever to throw the clutch out and break the motor circuit, bringing the entire machine to a standstill.

The machine is adjusted to feed slightly beyond the break-through before reaching the lower dead center; and upon passing this point 600-lb. counterweights on the two large spur gears simultaneously pass over the top point of equilibrium and throws out of balance, whirling the spur gears through an arc of 180 degrees and raising the drill beam back approximately to starting position.

The lubricating system is especially noteworthy. A shallow trough directly behind the spindle sockets is filled with lubricant to a depth of about 1 in., from which it is fed mechanically through independent lubricating units to each drill individually. These units are essentially a disk carried on a hollow spindle suspended from the drill housing. The disks carry fins or ribs on the back, curved to pick up on these narrow shelves driblets of the fluid, which are run centripetally by a slight oscillation into holes through the hub opening into the hollow stem. A small downward pitch to the stem suffices to carry the cutting compound out on to a gutter on the spindle, bored to drop it through so as to run down the drill surface. The units are turned back and forth approximately 180 deg. by a small connecting rod and piston driven off the shaft pinioned to the worm gear. A quadrant lever oscillates a chain which turns the lubricators by means of sprockets just back of the disks.

The driving chains run over sprockets at each end of the cross-rail. Those at the left end run on idlers. At the right hand end of the machine they are keyed to the same shaft as the flat bevel gear driven by a bevel pinion on the shaft carrying the pulley belt-driven by a 50-hp. alternating current motor which is rated



The Motor and Driving Gear Are at the Top of the Frame, Giving a Clear Working Space About the Machine and Making for Safe Operation

to run at least 60 1-in. spindles through 2 in. of soft steel.

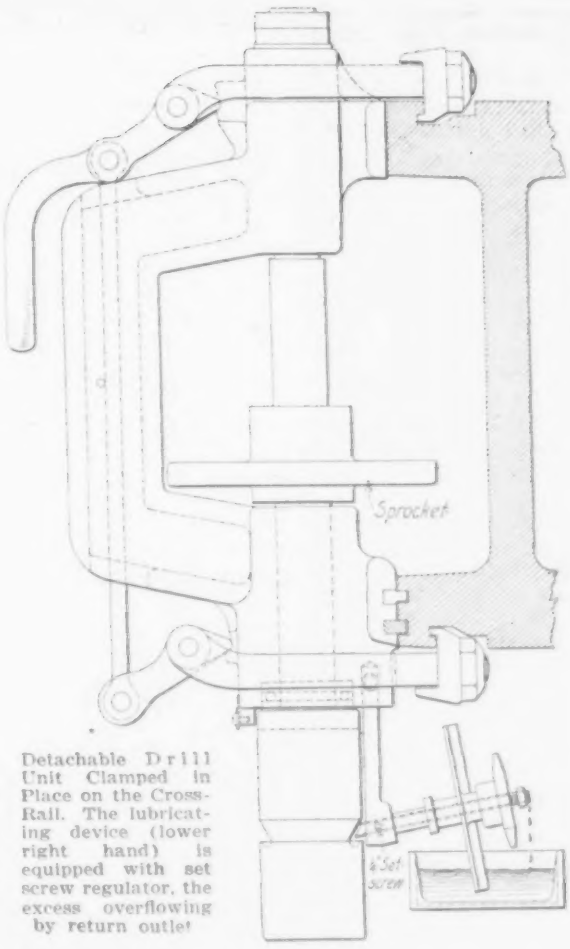
The drill feed mechanism is operated by the worm gear on the lower end of this driving shaft, which drives a chain actuating a gear keyed to a shaft running across the back of the machine and connected at each end by trains of reduction gears to two spur feed gears, 4½ ft. in diameter. These large spur gears are mounted on shafts, on the front end of which are disk cranks. The connecting rods, on which the drill beam is hung, are eccentrically mounted on the disk cranks, and at the lower end are pinned to the drill carriage.

The drill feed is, therefore, controlled by the rotation of the large spur gears. The adjustment of the drills to the starting position is done by hand, for the reason that it requires but a moment, and tends to breed caution in the operator before starting the machine. After the work has been set in position, the drill man steps to the hand wheel, seen in the side view beneath the motor, and by a few quick revolutions advances the spur gears to bring the drill spindles almost in contact with the work.

The low power consumption permits the use of this machine with great economies wherever multiple drilling through heavy sections is required, notable results along these lines having been accomplished at the plant

of the Badenhausen Co., Philadelphia, in boiler making. As shown in the illustrations, the production of boilers is reduced to a manufacturing process.

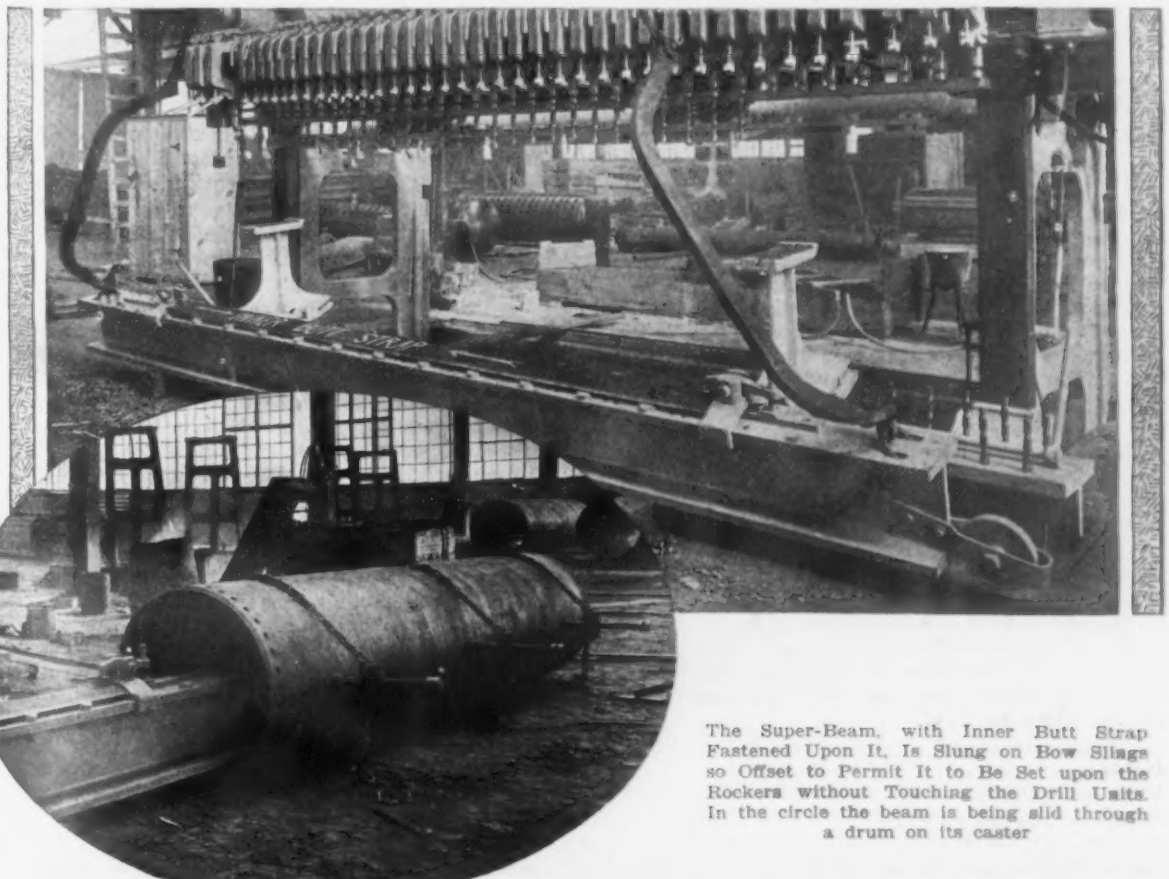
For riveting the boiler drum the plate is first rolled to shape. Then the outer butt strap is set along the seam of the shell and gripped in place by chain sling-jacks placed at intervals along the shell and tightened by hand lever to secure a perfect butt. For supporting the work during the operations use is made of a super-beam consisting of a special H-beam equipped at the head end with a caster. The inner butt strap is first laid on the beam, after which the tail is lifted by the crane and it is rolled through the shell on the caster. It is now slung on bow slings and then raised by the crane against the butt joint and screw clamps are placed at each end holding the parts firmly in place. The work so rigged for drilling is now set upon special rockers in position upon the drill table.



Detachable Drill Unit Clamped in Place on the Cross-Rail. The lubricating device (lower right hand) is equipped with set screw regulator, the excess overflowing by return outlet

For most operations the base of the machine is set in a concrete pit and bolted in place. This brings the table about at floor level and the drill spindles approximately breast high, beneath the eye of the workman. The table is carried on two slides on the forward flanges of the frame and is raised and lowered by means of four 3-in. screws operated by worm drive, which on the machine here shown, for example, allows of work on cylindrical boiler drums up to 48 in. in diameter.

The work may be done either in the flat or after rolling and shaping, carriages designed for the various types of work being readily fitted upon the table of the machine. The cross-rail carrying the drilling heads or units, a strong I-beam in section, is brought into position and the rigging adjusted to line the drills with the center line of holes to be drilled. The work is then clamped, and the drilling started. For clamping the work and holding it secure while cutting is going on, a powerful lever clamp is provided. It consists in a heavy pivoted frame set inside the frame of the machine back of the drills. The forward part is linked to the upper side of the cross-rail, and at intervals clamping fingers reach out over the work. As the drill carriage is brought down to starting position it presses these clamps firmly against the material to be drilled. Heavy compression springs act to cushion the device and compensate for the vertical travel of the drill carriage. In the heavy-



The Super-Beam, with Inner Butt Strap Fastened Upon It, Is Slung on Bow Slings so Offset to Permit It to Be Set upon the Rockers without Touching the Drill Units. In the circle the beam is being slid through a drum on its caster

duty plate drill the mechanism has a binding pressure of about 10 tons; but this is variable with the strength of the springs.

The radii of the sectors or rings insures that the holes will all be at right angles to the shell, and inasmuch as the butt straps and shell are drilled simultaneously, all parts are bound to come "fair." As an oversize hole of but 1/32 in. is required for the easy insertion of the rivet, this clearance is provided for in the drilling and the time usually consumed in punching, drifting and reaming is done away with. The uniformity of the holes with proper riveting practically insures that the swaging of the rivet will completely fill the space, reducing the tendency to shear as a result of any unequal expansion and contraction of the shell. The necessity for first laying out and then center punching each hole is dispensed with.

For drilling additional rows of holes, as in boiler or plate work, special stands are employed to suit conditions. For butt-strap rivet holes the super-beam becomes the bed of a cradle, which is set upon rockers and fastened by set screws. The rockers rest on curved beds, and are toothed along the outer half to mesh into pinions on a shaft extending between them. Detachable hand levers at the ends are used to turn the cradle until the next center line is brought beneath the points of the drills. A pointed sleeve jig is slipped over the end spindles and slid down to touch the work until correct alignment is obtained. For appropriate work, such as drilling tube holes in water-tube boilers, the shell is placed in rings instead of a cradle.

The type of machine built for heavy work is designed for a length up to 40 ft., or to carry not less than 75 drills; but it is stated by the manufacturer that any desired number of drills and any span may be had. The illustrations are of a model of 20 ft. working span weighing about 25 tons. When running there is an entire absence of jar or vibration, the only sound audible being the quiet hum of the drills cutting into the metal. The services of one intelligent operator and a helper are all the help needed to assemble the work and run the machine, a crane being employed for handling purposes.

For drilling ship plates, upward of 90 per cent of which are not "fashioned," hence are rectangular, the drill will accommodate one 25 ft. in length. Equipped with 75 to 100 drills the machine will drill the fore and aft seams, and supplemented by an auxiliary machine to bore the vertical holes, the entire plate, it is stated, can be completely drilled in about 15 min.

Providence Engineers Study War's Aftermath

The third annual banquet of the Providence Engineering Society was held on Feb. 12 at Providence, R. I., with the following speakers: P. H. W. Ross, "Public Participation in Maritime Affairs"; Leonard W. Cronkite, "Co-operating for Reorganization"; Alfred D. Flinn, "The Engineering Council"; Capt. Vincent Delport, "War Reminiscences"; Lieut. J. A. H. Muirhead, "War Operations on Inland Waterways"; Ensign C. L. McCrea, "The 14-in. Naval Batteries on Railroads."

Mr. Ross is president of the National Marine League. Mr. Cronkite, special agent U. S. Department of Labor, also treasurer Samoset Chocolate Co. and president Cronkite Co., a member of the resources and conversions section War Industries Board, and secretary Massachusetts board on non-war construction. Captain Delport represented the French High Commission and Lieutenant Muirhead is an engineer officer of the British army. Mr. Flinn is secretary of the Engineering Council. Ensign McCrea is of the Naval Board of Ordnance, and he described the 28-mile-range guns employed during last few months of the war in breaking up the German railroad supply lines back of Laon and Sedan.

Officers of the Providence Engineering Society are George A. Carpenter, president; John T. Frankenberg, James B. Hall, Warren B. Lewis, vice-presidents; William A. Kennedy, secretary; Lloyd E. Baker, librarian; Albert E. Thornley, treasurer.

CANADA IS HOPEFUL

Many Inquiries from Foreign Lands—Railroads Need Machine Tools

TORONTO, Feb. 17.—Iron and steel manufacturers of Canada are encouraged by the outlook for business. The railways of the Dominion require large supplies of rolling stock, rails and other equipment for which they will shortly be coming into the market. The Canadian National Railways has sent out specifications for some 15 machine tools for its shops at Leaside, Ont., which are to be used as soon as they are equipped for repair work. The machines asked for are not the regular railroad shop equipment, but include mostly general purpose lathes, planers, etc. Since the signing of the armistice, there have been more manufacturing concerns incorporated in the Dominion than during any other similar period since the outbreak of war, and a large number of these concerns will be establishing plants and will require equipment. It is expected that with the coming of spring, Canadian mining enterprises will commence development work on a very extensive scale and that there will be a great boom in machinery for this work is assured. Municipal, Provincial and Dominion governments are now preparing extensive plans for the carrying out of public works on an exceptionally large scale. This work has been held up for a few years on account of the scarcity of labor and material, which were in such demand during the war period for the manufacture of munitions and other war equipment that it was necessary to cancel all work on waterworks, electric and sewage disposal plants, harbor works and other Government undertakings.

Canadian iron and steel manufacturers have every reason to take an optimistic view of the future export trade of the country. A number of inquiries have been received at Ottawa for iron and steel products on foreign account. The Canadian Trade Commissioner has received a cablegram from London, England, stating that India is in the market for 800,000 tons of rails with angles, bolts, spikes, etc., for delivery in 1919, 1920 and 1921. The outlook for trade for Canada in France, Belgium and certain Balkan countries is very promising. France and Belgium will rebuild their war crippled industries as rapidly as possible, for which there will be a considerable demand for machinery and equipment the first year, but these countries intend to turn out the greater part of their needs in their own countries so as to keep their own labor employed and their money at home. It is not likely that, after the first year, there will be a great deal of business in this line offering from these two countries. Belgium is also in the market for vast supplies of agricultural machinery, tools, iron and steel products of various kinds, etc. Roumania, Serbia and Greece offer good opportunities for Canadian manufacturers and are willing to do business here. Roumania is willing to discuss contracts for rolling stock, railroad equipment, agricultural machinery, etc. China offers a vast market for mining, railroad, electric and other machinery, and Siberia requires agricultural machinery, railroad equipment, cars, locomotives, etc., mining machinery and tools. Great Britain has already set aside more than $150,000,000 for road-making machinery, chiefly for Scotland. Road rollers, stone crushers, steam tractors, spreader wagons and other equipment necessary for the construction and repair of roads will be required, and it is expected that it will not all be supplied from the British Isles. South Africa, France, Australia and other countries have placed large orders in Canada for rolling stock, rails, machinery of various kinds, etc.

Reports have been issued by the British Engineering Standards Committee on screw threads. One of these, No. C. L. 3750, covering French metric screw threads for aircraft purposes, is obtainable for 8d postpaid, and another, on the British standard fine, B.S.F., screw threads and their tolerances, No. 84, is available at 1s 2d. They may be had by addressing the committee at 28 Victoria Street, London, S. W. 1.

MANGANESE ALLOYS IN 1918

Ferromanganese Output Exceeded All Records —Spiegeleisen Supplies—Ore Situation

Another record was made by the American manganese-iron alloy industry in 1918. The domestic output of both ferromanganese and spiegeleisen by the blast furnaces and electric furnaces has steadily grown since 1913. In 1918 the production of 70 to 80 per cent ferromanganese reached the striking total of 345,306 gross tons, or 28,775 tons per month, according to the blast furnace reports of THE IRON AGE, which include most of the electric output also. This is the largest output of any year in the history of the industry and compares with 257,834 tons in 1917 or 21,486 tons per month, with 208,389 tons in 1916, or 17,365 tons per month, and with 119,496 tons in 1913 or 9958 tons per month. The output of 1918 compared with that of 1913 has therefore been nearly three times as great. The December output was 23,907 tons or the lowest for any month in the last half of 1918. Only two other months in 1918 were lower, January and February. The output for the other months in 1918 was given in THE IRON AGE, July 25 and Dec. 26, 1918.

A record was also made in spiegeleisen in 1918. The total for the year of all grades was 249,002 tons or 20,750 tons per month. The 1917 production was 188,852 tons or 15,737 tons per month. The December output was 25,528 tons. This exceeds any month in the first half of 1918 and is close to the monthly average for the last half. The lowest output in the last four years was 93,282 tons in 1915.

The following table based on the monthly blast furnace reports of THE IRON AGE gives the output of ferromanganese and spiegeleisen in the United States for the past seven years:

Ferromanganese and Spiegeleisen Output in the United States —Gross Tons

	Ferro-manganese	Spiegel-eisen	Total	Average per Month
1918	345,306	249,002	594,308	49,525
1917	257,834	188,852	446,686	37,222
1916	208,389	197,518	405,807	33,817
1915	146,542	93,282	239,824	19,985
1914	106,083	100,365	206,448	17,204
1913	119,495	126,081	245,576	20,464
1912	125,378	119,506	244,884	20,407

Imports, Exports and Available Supply

Details of the production, imports and exports as well as the available supply for the last few years are as follows:

Ferromanganese Monthly Output, Imports, Exports and Available Supplies—Gross Tons

	Output	Im-ports	Ex-ports	Available Supply
Monthly average first half 1918	26,670	3,079	426	29,323
Monthly average last half 1918	30,880	1,449	174	32,155
Monthly average 1918	28,775	2,264	298	30,741
Monthly average 1917	21,486	3,703	776*	25,413
Monthly average 1916	17,365	7,577	...	.....
Monthly average 1915	12,021	4,605	...	.....
Monthly average 1913	9,958	10,672	...	.....
Monthly average 1912	10,448	8,261	...	.....
Av. average, 1910 to 1914	8,280	8,399	...	.....

*Last half only.

The output of ferromanganese in 1918 was 20,000 tons per month more than the 5-year average of 1910 to 1914 inclusive and nearly three times per month what it was in 1913. The theoretical available supply, or the exports deducted from the total of output and imports, advanced over 5000 tons per month in 1918 or from 25,413 tons per month in 1917 to 30,741 tons in 1918.

The curtailment in imports of British alloy, a war measure still in force, has been pronounced. Only 177 tons came in Dec. 1918, with the average for the last half of the year 1449 tons per month, the bulk of this having been received in July and August. Imports in 1913 were 10,672 tons per month or over half of the consumption. The 5-yr. average, 1910 to 1914, was 8399 tons per month, but since 1916 the monthly imports have gradually declined from 7500 tons to less than 200 tons per month at present.

Manganese Ore Imports

Supplies of imported manganese ore were larger than expected in 1918 though they were less than either 1917 or 1916, record years. The following table from Government statistics shows the imports of high grade ore in the last few years:

Manganese Ore Imports—Gross Tons

Year	Total	Monthly Average
1918	491,303	40,942
1917	629,972	52,498
1916	576,324	48,027
1915	320,784	26,732
1913	345,084	28,757

For the sake of illustration and argument it may be assumed that all the imported ore, or its equivalent from the 1917 supply, was converted into ferromanganese. Then the 490,000 tons received in 1918 would equal about 200,000 of ferromanganese. To produce the remainder of the domestic alloy made, not far from 360,000 tons of domestic ores was necessary, a remarkable showing.

British Manganese Ore

It is interesting to compare the British manganese ore imports. In 1918 these were 365,606 gross tons against 331,264 tons in 1917. In 1914, 1915 and 1916 these imports were close to an average of 465,000 tons per month. These compare with a pre-war record of 601,177 tons in 1913.

The analysis of the situation as to ferromanganese supplies and needs in THE IRON AGE, Dec. 26, 1918, still holds. At that time it was estimated theoretically that with a steel output of 45,000,000 tons of ingots and castings in 1918, about 351,000 tons of 70 per cent alloy would be required. The actual output was over 345,000 tons, indicating practically no shortage and no oversupply, according to the theoretical estimate.

Advance in German Steel Prices

The rise of prices for steel products in Germany during the war has passed through a number of gradual stages. The following table published by *Engineering* shows the upward march of the prices since the commencement of the war.

1914	Ingots. Marks	Bundles. Marks	Plates. Marks	Sections. Marks
Second quarter	82.50	95.00	97.50	110.00
Third quarter	82.50	95.00	97.50	110.00
Fourth quarter	90.00	102.50	105.00	110.00
1915				
First quarter	90.00	102.50	105.00	120.00
Second quarter	92.50	110.00	112.50	120.00
Third quarter	102.50	115.00	117.50	130.00
Fourth quarter	102.50	115.00	117.50	130.00
1916				
First quarter	102.50	115.00	117.50	130.00
Second quarter	107.50	122.50	127.50	140.00
Third quarter	127.50	142.50	147.50	160.00
1919				
First quarter	285.00	300.00	305.00	320.00

As an excuse for its action the German steel makers' association asserted that the difficulties due to the Allies' occupation of the left bank of the Rhine were constantly on the increase, and that the recent wage raises and the institution of the 8-hr. working day were calculated to jeopardize the future of even the strongest firms unless there was a corresponding rise in prices, says the *Berliner Tageblatt*. This paper also pointed out that the shortage of ore and coal was causing a material reduction in the output and, furthermore, that the low value of the mark in foreign exchange made the compulsory paying of the workers in Lorraine and Luxemburg in francs a great hardship. Commenting upon this statement, the *Tageblatt* admits that during the last few months the cost of production has increased considerably, but it points out that for more than a year the raw materials department of the old war ministry had refused to allow an advance in steel and iron prices, and that the 1917-18 reports of the various companies had amply justified the contention that they were making big profits.

BUILDING DRY DOCKS

Contracts for Seven of Floating Type Let—Others Are Recommended

WASHINGTON, Feb. 18.—The United States Shipping Board is trying to secure action on the project for 20 big dry docks for the Atlantic Coast. The Port and Harbor Facilities Commission of the board has recommended their construction in a report declaring that they will be needed to take care of the enlargement of our merchant marine. The board has been trying to interest private capital in these enterprises, but so far with only moderate success.

The plan is to build 10 docks for the harbor of New York, five at Boston, three at Philadelphia, one at Charleston, S. C., and one at Pensacola, Fla. This is in addition to the dock projects also under consideration for Baltimore and Norfolk. The 10 New York docks would alone represent an investment of about $25,000,000. But this would include the repair plants and other necessary machinery accessory to such an enterprise.

During the war, the Emergency Fleet Corporation was ready to finance these projects up to about 70 per cent of the actual outlay. Since the signing of the armistice, however, some doubt seems to have arisen as to the authority of the board to devote governmental funds to such financing. It is, however, still ready to loan money to any corporation, either private or municipal, which desires to carry out such an enterprise. It is also ready to submit statistics and general information concerning the need for such a project. For instance, an enterprise of this character is now being financed in Norfolk, to locate such a dock there. It is planned to have a capital of about $5,000,000 of which approximately $3,000,000 is reported to have been subscribed by private interests.

To expedite action of this kind, the board has decided to begin the construction of floating dry docks and then, either to loan these docks or to permit corporations to purchase them. This will hasten the final operation of such facilities. Seven such contracts have been let by the Emergency Fleet Corporation. Five are for dry docks of 10,000 tons capacity each and two of 20,000 tons. The letting of the contracts was also made in such a way as to help to take the place of the wooden shipbuilding construction cancelled by the board last month. When completed these docks can be towed to any of the cities where it may then be decided to locate the permanent facilities.

Besides these docks there are twin Graving docks in the navy yard at Norfolk constructed in co-operation with the shipping board which are to be open to merchant marine use. The Bethlehem Shipbuilding Corporation at Sparrows Point, Md., has also constructed a 20,000 ton floating dry dock. Besides this there are 2500-ton marine railways at Portland, Me.; Somerset, Mass.; Hampton, Va.; Savannah, Ga., and Jacksonville, Fla.; a 3200-ton marine railway at Providence, R. I.; an 8000-ton floating dry dock at Savannah, Ga., and a 6000-ton floating dry dock at Jacksonville, Fla.

Bettering Conditions of Steel Workers

The Bureau of Safety, Sanitation and Welfare of the United States Steel Corporation has issued bulletin No. 7 covering the scope of its operations up to December, 1918.

Few people, it is safe to say, realize how widely diversified are the activities of the bureau. The Steel Corporation spends some $10,000,000 annually in bettering conditions among its employees, and its efforts are not confined to the prevention of accidents, although this constitutes an important phase, but include sanitation, education, housing, medical attention and social activities; in fact, everything that is likely to make the workers happier and more contented.

A significant accident chart sets forth graphically the good results obtained in the safety campaign. Taking as a basis 1906, when the campaign was inaugurated, the chart shows an almost continuous decrease in the accident rate, which in 1918 was 51.6 per cent less per thousand men than in 1906.

Statistics gathered by the bureau indicate that large percentage of accidents are due to the careless ness of the workmen, and as a result the education of the worker in avoiding accidents plays an important part in the safety campaign.

Better housing facilities for the corporation's workers, the establishment of clubs, athletic, musical and similar organizations, are the subjects of particularly interesting chapters in the bulletin. A number of pictures show what has been done in this respect at Morgan Park, the most important of the newer steel towns built by the corporation to provide living accommodations for the workers at the Duluth plant of the Minnesota Steel Co., and at the smaller towns of Lynch, Ky., Chickasaw, Ala., and others.

Of much interest at this time are the efforts of the corporation toward the Americanization of its alien employees. These are offered classes in English and other opportunities to get acquainted with American thought and ideals.

The index of the bulletin gives in condensed form an idea of the range of its work. The various titles in the index are: Accidents; Americanization; "American in the Making" (motion picture); Block Type House; Boarding Houses; Bureau of Safety; Sanitation and Welfare; Chickasaw, Ala. (description); Clubs Donora, Pa. (description); Expenditures for Welfare; First Aid and Rescue; Gardens; Good Fellow Clubs; Hospitals (base) and (emergency); Lynch, Ky. (description); McDonald, Ohio (description); Morgan Park (description); Motion Pictures; Organization Committees; Pension Fund; Playgrounds; Practical Housekeeping Centers; Restaurants; Sanitation; Stock Subscription; "The Reason Why" (motion picture); Vegetable Cellars; Vegetable Storage; Visiting Nurses; Westfield, Ala. (description); "Why" (motion picture); Wilson Station, Pa. (description).

The bulletin is attractively got up, contains 16[illegible] pages, and is profusely illustrated.

To Establish Heating and Ventilating Standards

A research bureau on heating and ventilating has been established in the Bureau of Mines, Pittsburgh, with the approval of the Department of the Interior at Washington. Office space with equipment and the use of the well-equipped laboratories will be made available for the work, which will be conducted under the auspices of the American Society of Heating and Ventilating Engineers. An appropriation of $15,000 a year has been set aside by the society for research relating to heating and ventilation, particularly directed toward establishing standards. Samuel Dibble, head of the department of heating and ventilating at the Carnegie Institute of Technology, and member of the society, last week was appointed a member of the committee of ten to carry the work through.

Proceedings in equity have been instituted in the United States District Court for the Southern district of New York, in order to bring about the reorganization of the Hurlburt Motor Truck Co., New York. The court has appointed W. B. Hurlburt temporary receiver. Proceedings are of a friendly nature and were made necessary on account of the institution of bankruptcy proceedings.

In its special foreign trade bulletin on the Belgian Congo, the National Association of Manufacturers, 30 Church Street, New York, foreign trade department, states that in that region rich iron ore, containing up to 60 per cent iron, is found in many sections and will probably be worked when cheap transportation or industrial enterprises in Africa permit economic utilization.

The name of the William F. Remppis Iron Works, Reading, Pa., has been changed to the Architectural Iron Works. William F. Remppis severed connection with the company some time ago, but its affairs have not been changed except as to name.

PERSONAL

Charles W. Moon, director of personnel R. K. LeBlond Machine Tool Co., Cincinnati, and one of the organizers of the Employment Managers' Association, Cincinnati, has accepted the position of director of personnel Timken Roller Bearing Co., Canton, Ohio.

J. H. Frantz, vice-president American Rolling Mill Co., Columbus, Ohio, expects to leave at an early date for a three months' vacation trip to the Orient.

F. H. Lewis, manager order and shipping department, Midvale Steel & Ordnance Co., Philadelphia, has resigned to accept a similar position with the Jones & Laughlin Steel Co., Pittsburgh.

H. L. Greene has been appointed chief metallurgist of the Willys-Overland Co. of Toledo and its allied companies.

A. A. Straub has been elected vice-president and general manager of the Superba Coal & Coke Co. of Pittsburgh.

C. G. Ugglas, draftsman and designer Youngstown Sheet & Tube Co., Youngstown, Ohio, has resigned to organize a branch office for the Tillus Co., a Finland corporation engaged in the exporting business. Mr. Ugglas will be associated with the company as branch manager, with headquarters in New York.

Major-General William Murray Black of the Army Engineers, has been elected chairman of the Port and Harbor Facilities Commission of the United States Shipping Board, succeeding Edward F. Carry, Chicago, who recently resigned. General Black will continue his military duties in addition to those as chairman of this commission.

W. F. Saunders, formerly secretary of the Missouri State Council of National Defense, has been appointed the United States representative of the Chamber of Commerce of Mexico. Mr. Saunders has opened offices in the Commercial Building in St. Louis, which will act as a clearing house of information for American manufacturers and exporters interested in Mexico, and for Mexican business men interested in the United States.

Floyd Parman of the Chicago office of the Hendey Machine Co., has been transferred to the Rochester office of the company where he will have charge of that territory. Mr. Parman, while attached to the Chicago office, gave much of his attention to the St. Louis district. He will be succeeded at Chicago by W. C. Scott, who has been associated with the W. F. Davis Machine Tool Co.

Paul E. Ryan has resigned as assistant general manager of the Cleveland-Osborn Mfg. Co., Cleveland, and has become associated with the Aluminum Castings Co., Cleveland, as director of production.

Herbert C. Platt, formerly connected with the Pusey & Jones Co., Gloucester, N. J., has joined the sales force of the Pennsylvania Forge Co., Philadelphia, and will devote his time chiefly to New England territory.

J. N. Forker, chief draftsman of H. Koppers Co., Pittsburgh, builder of Koppers By-product coke ovens, delivered an address Friday evening, Feb. 14, before the Pennsylvania State Mining Society, State College, Pa., on "The Operation of the By-Product Coke Plant." The talk was illustrated by about 1800 feet of film, showing the entire operation of the Koppers by-product coke plant.

Theodore R. Hermanson, formerly of the Harrison, N. J., works of the Worthington Machinery Corporation, has resigned and has been made works manager of the Epping-Carpenter Pump Co., Pittsburgh, manufacturers of pumping machinery and condensers.

Edward A. Moss, who closed his office last June to take charge of the Artillery Section, Procurement Division, in the Cleveland District Ordnance Department, U. S. Army, has re-opened his sales office at 2031 Euclid Avenue, Cleveland, for steel construction of all kinds.

W. W. Wallace, formerly with the Hussey-Binns Steel Co., Pittsburgh, has been named steam and hydraulic engineer of the Pittsburgh Crucible Steel Co. at its Midland, Pa., works.

H. P. Pope, until recently in the machine tool department of the Neville Island ordnance plant, and previously with the Savage Arms Corporation, Sharon, Pa., has become affiliated with the Thomas Spacing Machine Co., Pittsburgh, in charge of one of its manufacturing departments.

George W. Hite, for 10 years a member of the sales force of the Pittsburgh Iron & Steel Foundries Co., Pittsburgh, who relinquished that position Aug. 1, 1918, to enter the Ordnance Production Division of the War Department at Washington, has retired from the Government service. On Feb. 1, he contracted for ten years with the Pittsburgh Steel Foundry Co. to manufacture his own invention known as vacromite, a patent for which has been applied for, and to be used by the latter company in the manufacture of rolls and pinions. This invention of Mr. Hite is a steel alloy, and was made after a long study of mill conditions.

George C. Adams, formerly at the Homestead Steel Works of the Carnegie Steel Co., Homestead, Pa., who was granted six months' leave of absence on Aug. 19 last year, to take charge of a new metallurgical laboratory of the Union Spring & Mfg. Co., New Kensington, Pa., on 10-in. shells for the Government, severed his connection with the Carnegie Steel Co. on Feb. 19, and has been appointed chief metallurgist of the Union Spring & Mfg. Co.

W. D. Creider, formerly with the Saxer-Creider Co., Erie, Pa., dealer in machine tools, has resigned and is now with the Modern Tool Co., Erie. He will open an office in Cleveland, covering the northern and eastern part of that state, handling a full line of grinders made by the company, as well as small tools.

The La Belle Iron Works, Steubenville, Ohio, has opened a sales office in Seattle, Wash., to look after its Northwestern trade, which will be in charge of Lynn T. Banks, formerly sales agent in the Pacific Coast department of the United States Steel Products Co.

Fred Howarth has been appointed superintendent of the Alicia mines Nos. 1 and 2 of the W. Harry Brown interests on the Monongahela River. Previously Mr. Howarth had served seven years with the Tower Hill-Connellsville Coke Co., first as mining engineer, and later as superintendent.

C. L. Perry, formerly general manager of the Equitable Coke Co., has resigned and has been made president of the Midvale-Doshen Coal Co., Cleveland. He was given a luncheon at the Duquesne Club, Pittsburgh, by his former associates in the Equitable Coke Co.

J. T. Dougherty, formerly superintendent Mercer, Pa., works of the American Sheet & Tin Plate Co., has gone to California for several months to recuperate from a recent illness.

John R. Foster, formerly with the Iron & Fuel Trading Co., Pittsburgh, has been appointed general manager of sales, ingot mold department, of the Valley Mould & Iron Corporation, with offices in the Union Bank Building, Cleveland. Ralph C. Velte, formerly with the Marshall Foundry Co., Pittsburgh, has been appointed manager of sales, castings department, with offices in the Oliver Building, Pittsburgh. Mr. Gault, formerly with the Browning Engineering Co., Cleveland, has been appointed general auditor. The general offices of the company will remain in Sharpsville, Pa., and there have been no other changes in the personnel of the company.

William H. Hulick, Jr., son of President William H. Hulick, Warren Foundry & Machine Co., New York, has returned home after two years' service in the Navy on the destroyer *Manley*. He has been honorably discharged with a letter of high commendation from the captain of the *Manley* for bravery in service. When the *Manley* collided with a British vessel and a number of depth bombs were accidentally exploded, resulting in the death

of a large number of seamen, Mr. Hulick jumped into the water and rendered valuable service in rescuing sailors who were in imminent danger of drowning.

Lieut. C. A. Carpenter, who during the war was attached to the Pittsburgh district office of the Ordnance Department, recently retired and has become auditor of the Valley Forging Co., Verona, Pa. Before entering the army, Lieut. Carpenter was chief engineer of the Quasi-Arc Weldprode Co., New York, and before that was for several years general foreman of the Camden Iron Works, Camden, N. J.

George F. Hopkins, for the past 10 years superintendent of the Frost Gear & Forge Co., Jackson, Mich., has been appointed works manager of the Logansport Machine Co., Logansport, Ind.

Lieut W. K. Callow has returned to his position with the Debevoise-Anderson Co., New York, after nearly two years with the colors, about six months having been spent in airplane service in France.

M. E. Cooley, president of the American Society of Mechanical Engineers, was the guest of the Worcester Section, on Feb. 19, at a meeting held in the Worcester Polytechnic Institute, Worcester, Mass. After the reception and dinner an illustrated lecture was given by Eskel Berg, General Electric Co., on the "Recent Development of Propelling Machinery for War and Merchant Vessels."

The Cheever Iron Ore Co.'s properties, located near Port Henry, N. Y., have been closed down indefinitely. A. E. Hodgkins, former general manager of the properties, has been appointed to the newly created office of comptroller of Witherbee, Sherman & Co., producers of iron ore, Port Henry.

Geo. H. Ruppert, who, before his entry into the chemical warfare branch of the service had charge of the sodium-ferro cyanide department of the Semet-Solvay Co., has accepted a position as advisory engineer with the Powdered Coal Engineering & Equipment Co., Chicago.

Dan Klauber, president A. Klauber & Sons Iron & Metal Co., St. Louis, has received word that his son, Lester, 19 years old, has been decorated for bravery. Young Klauber is one of the three survivors of the 30 men who were the first to enlist in the gas service from St. Louis. He was in the battles of Chateau-Thierry, St. Mihiel and Argonne forest, and came out of all of them unscathed.

Fred E. Rogers, for nearly 20 years identified with *Machinery*, most of that time as editor, is consulting mechanical engineer of the Service Engineering Co., 25 Church Street, New York, engaged in planning, estimating and production work for metal working plants and in designing tools, dies, jigs and gages. Albert A. Dowd is production engineer, Donald A. Baker is tool engineer and Thomas P. Orchard, recently production manager New Britain Machine Co., is sales engineer.

Frank Swift, formerly efficiency engineer for Pusey & Jones, is taking charge of the sales work of F. A. Brady, Inc., 30 Church Street, New York, in the Philadelphia district, and will handle products for which this company is the sole selling agent.

Edward W. Dodge, for many years with the Norton Co. of Worcester, Mass., as sales manager, has been appointed general sales and works manager of the Star Corundum Wheel Co., Detroit.

Emil Geil was elected president of the Perfect Stove & Mfg. Co., Belleville, Ill., at the recent annual stockholders' meeting. The other officers chosen were G. D. Klemme, vice-president; A. E. Krebs, secretary-treasurer; G. A. Schrader and E. W. Eckhardt, directors.

Edward A. Lambert, recently construction engineer for the Procter & Gamble Co., Cincinnati, has joined the staff of Fletcher-Thompson, Inc., industrial engineers, and is located at their general office as Bridgeport, Conn.

H. Lad Landau, general sales manager Rownson, Drew & Clydesdale, Inc., manufacturer of cargo-handling machinery, etc., 68 William Street, New York, leaves early in March for a two weeks' stay at the company's San Francisco office, prior to a year's trip through the Orient and the Far East. In addition to the company's present office at Calcutta he will establish other connections in that part of the world.

Lieut.-Colonel George K. Hooper, formerly in charge of tank, tractor, truck and trailer production in the ordnance department, has received an honorable discharge and has taken up again his duties as president of the Hooper-Falkenau Engineering Co., industrial engineer and architect. The company has moved its offices from the Woolworth Building to 101 Park Avenue, New York.

George Endicott has severed his connection with the Wickwire Steel Co., Buffalo, where he has held the position of assistant sales manager.

Zenas W. Carter has been appointed managing executive of the Material Handling Machinery Manufacturers' Association, a recently formed organization. Mr. Carter will have office in New York after March 1. He has resigned from the chairmanship of the War Service Committee on Metal Lath, which position he has held during the war.

Frank G. Payson has resigned as president of the Neidow & Payson Co. and has organized the Frank G. Payson Co., with offices at 9 South Clinton Street, Chicago. The company has been appointed general selling agent for the Logansport Machine Co., manufacturers of the Logan air operated chucks.

Willis B. Clemmitt has joined the engineering staff of the Powdered Coal Engineering & Equipment Co., Chicago, in the capacity of advisory engineer. Mr. Clemmitt was formerly assistant superintendent of the open-hearth department of the Central Iron & Steel Co., Harrisburg, Pa.

Freyn, Brassert & Co., engineers, People's Gas Building, Chicago, announce the appointment of Wyman Eaton as chief engineer, which took effect Feb. 1. Mr. Eaton was formerly connected with the engineering offices of Julian Kennedy, Youngstown Sheet & Tube Co., William Tod Co., Corrigan, McKinney & Co., and has recently resigned his position of engineer in charge of the rolling mill work of the Mesta Machine Co. to take up his new duties.

Edward R. Ladew Co., manufacturer of leather belting, with factory and general offices at Glen Cove, New York, announces that O. S. Horton has been appointed manager of its Southern branch, with headquarters at Charlotte, N. C., and territory covering all states south of Maryland, West Virginia, Kentucky and Arkansas, west to Texas. Walter Carr, formerly of the New York office, is assistant branch manager. Several new salesmen have been added to the organization.

W. P. Snyder, Sr., chairman of the Shenango Furnace Co., Pittsburgh, has gone to Palm Beach, Fla., to remain until about April 1.

The Northwest Steel Co., Portland, Ore., has retired from structural steel lines. It will confine itself to the manufacture of steel ships, and has sold its stock of standard structural steel to the Northwest Bridge & Iron Co. The latter company will handle the former plain material and fabricated steel as well as the bolt and rivet end of the business. W. H. Cullers, for the past 10 years chief engineer for the Northwest Steel Co., heads the new company.

Report of the Carnegie Steel Co., Employees' Relief Association of the Ohio works for last year shows that disbursements were $21,905.05, leaving a balance on hand Jan. 1, 1919, of $20,380.86. The sum of $8[illegible] was distributed through death of members. Since it was formed, Sept. 10, 1898, the association has paid benefits of $145,473.94. Officers elected for 1919 are President, John H. Davis; vice-president, Walter J. Collins; secretary, James Griffith; assistant secretary, Thomas McKinley, and treasurer, David Kline.

Warren Webster & Co., Camden, N. J., makers of feed water heaters, have opened a branch office at 801 Sumpter Building, Dallas, Tex., with W. B. Irwin in charge as district representative.

Production of Ingots and Rolled Products

Statistics Compiled by the American Iron and Steel Institute Show New Record for Steel and Some Finished Forms in 1917

PRODUCTION OF STEEL INGOTS AND CASTINGS

PRODUCTION OF STEEL INGOTS AND CASTINGS BY PROCESSES.

Years	Open-hearth Basic	Open-hearth Acid	Open-hearth Total	Bessemer	Crucible	Electric.	Miscellaneous.	Total Gross tons.
1903	4,734,913	1,094,998	5,829,911	8,592,829	102,434	....	9,804	14,534,978
1904	5,106,367	801,799	5,908,166	7,859,140	83,391	....	9,190	13,859,887
1905	7,815,728	1,155,648	8,971,376	10,941,375	102,233	....	8,963	20,023,947
1906	9,658,760	1,321,653	10,980,413	12,275,830	127,513	....	14,380	23,398,136
1907	10,279,315	1,270,421	11,549,736	11,667,549	131,234	....	14,075	23,362,594
1908	7,140,425	696,304	7,836,729	6,116,755	63,631	....	6,132	14,023,247
1909	13,417,472	1,076,464	14,493,936	9,330,783	107,355	13,762	9,185	23,955,021
1910	15,292,329	1,212,180	16,504,509	9,412,772	122,303	52,141	3,194	26,094,919
1911	14,685,932	912,718	15,598,650	7,947,854	97,653	29,105	2,844	23,676,106
1912	19,641,502	1,139,221	20,780,723	10,327,901	121,517	18,309	2,853	31,251,303
1913	20,344,626	1,255,305	21,599,931	9,545,706	121,226	30,180	3,831	31,300,874
1914	16,271,129	903,555	17,174,684	6,220,846	89,869	24,009	3,622	23,513,030
1915	22,308,725	1,370,377	23,679,102	8,287,213	113,782	69,412	1,527	32,151,036
1916	29,616,658	1,798,769	31,415,427	11,059,039	129,692	168,918	604	42,773,680
1917	32,087,507	2,061,386	34,148,893	10,479,960	126,716	304,543	495	45,060,607

PRODUCTION OF STEEL INGOTS.

Years	Open-hearth Basic	Open-hearth Acid	Open-hearth Total	Bessemer	Crucible	Electric.	Miscellaneous.	Total Gross tons.
1903	4,600,034	829,529	5,429,563	8,574,730	97,025	.....	3,395	14,104,713
1904	5,007,448	597,884	5,605,332	7,843,089	79,083	.....	2,172	13,529,676
1905	7,609,569	835,267	8,444,836	10,919,272	96,500	.....	2,572	19,463,180
1906	9,345,212	915,310	10,260,522	12,243,229	117,170	.....	3,510	22,624,431
1907	9,912,839	890,372	10,803,211	11,634,276	121,001	.....	989	22,559,477
1908	6,985,420	539,532	7,524,952	6,096,196	55,360	.....	519	13,677,027
1909	13,111,457	781,439	13,892,896	9,296,999	94,672	13,456	786	23,298,779
1910	14,828,333	782,825	15,611,158	9,354,437	107,671	50,821	.....	25,154,087
1911	14,399,306	628,153	15,027,459	7,890,733	82,623	27,227	417	23,028,479
1912	19,197,604	712,271	19,909,875	10,259,131	100,967	14,147	542	30,284,662
1913	19,884,465	805,250	20,689,715	9,465,200	103,655	20,973	587	30,280,130
1914	15,936,985	633,382	16,570,367	6,154,964	78,683	15,458	312	22,819,784
1915	21,975,622	968,148	22,943,770	8,194,737	99,026	46,348	331	31,284,212
1916	29,011,146	1,227,832	30,238,978	10,916,248	120,341	126,048	302	41,401,917
1917	31,528,939	1,406,798	32,935,737	10,320,688	122,882	239,632	261	43,619,200

PRODUCTION OF STEEL CASTINGS.

Years	Open-hearth Basic	Open-hearth Acid	Open-hearth Total	Bessemer	Crucible	Electric.	Miscellaneous.	Total Gross tons.
1903	134,879	255,469	390,348	18,099	5,409	...	6,409	430,265
1904	98,919	203,915	302,834	16,051	4,308	...	7,018	330,211
1905	206,159	320,381	526,540	22,103	5,733	....	6,391	560,767
1906	313,548	406,343	719,891	32,601	10,343	....	10,870	773,705
1907	366,476	380,049	746,525	33,273	10,233	....	13,086	803,117
1908	155,005	156,772	311,777	20,559	8,271	....	5,613	346,220
1909	396,005	205,035	601,040	33,814	12,683	306	8,399	656,242
1910	433,976	429,375	863,351	58,335	14,632	1,320	3,194	940,832
1911	266,626	304,565	571,191	57,101	14,030	1,878	2,427	646,627
1912	443,998	426,850	870,848	68,750	20,550	4,162	2,311	966,621
1913	460,161	450,055	910,216	80,506	17,571	9,207	3,244	1,020,744
1914	334,144	270,173	604,317	65,882	11,186	8,551	3,310	693,246
1915	333,103	402,229	735,332	92,476	14,756	23,064	1,196	866,824
1916	605,512	570,937	1,176,449	142,791	9,351	42,870	302	1,371,763
1917	558,568	654,588	1,213,156	159,272	3,834	64,911	234	1,441,407

In 1917, 202 works in 27 States and the District of Columbia made steel ingots, against 174 works in 25 States and the District of Columbia in 1916.

In 1917, 242 works in 28 States, the District of Columbia, and the Canal Zone, Panama, made steel castings, against 230 works in 28 States, the District of Columbia, and the Canal Zone Panama, in 1916.

DUPLEX STEEL INGOTS AND CASTINGS.

Included in the 32,087,507 tons of basic open-hearth steel ingots and castings produced in 1917 are 3,791,830 tons of duplex steel ingots and castings which were made from metal partly purified in Bessemer converters and finally purified in basic open-hearth steel furnaces, against 3,436,457 tons in 1916, an increase of 355,373 tons, or 10.3 per cent. In 1915 the production was 1,781,491 tons and in 1914, 835,690 tons.

In 1917 duplex steel was produced by 10 works in 6 States, against 9 works in 5 States in 1916, 6 works in 4 States in 1915, 5 works in 4 States in 1914, and 9 works in 5 States in 1913.

ALLOY STEEL INGOTS AND CASTINGS

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS.

Years	Ingots	Castings	Total	Years	Ingots	Castings	Total
1910	538,462	29,357	567,819	1914	577,107	69,846	646,953
1911	425,169	56,290	481,459	1915	923,251	97,896	1,021,147
1912	689,392	103,109	792,501	1916	1,306,157	56,458	1,362,615
1913	625,430	88,927	714,357	1917	1,576,806	67,529	1,644,335

APPROXIMATE PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS, BY PROCESSES, GROSS TONS, 1917.

Processes	Ingots	Castings	Total
Open-hearth steel—basic	1,043,771	2,080	1,045,851
Open-hearth steel—acid	275,598	31,247	306,845
Bessemer steel	78,257	32,683	110,940
Crucible steel	49,898	223	50,121
Electric steel	129,282	1,296	130,578
Total	1,576,806	67,529	1,644,335

In 1917 there were 120 works in 20 States and the District of Columbia which made alloy steel ingots or castings.

ROLLED IRON AND STEEL.

In 1917 the production of all kinds of iron and steel rolled into finished forms (including blooms, billets, and axle blanks rolled for forging purposes and semi-finished products which were rolled for export in that year) shows an increase of 687,311 tons, or 2.1 per cent., as compared with the output in 1916.

TOTAL PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, 1887–1917.

Years	Iron and steel rails	Plates and sheets	Nail plate	Wire rods	Structural shapes	All other finished rolled products	Total Gross tons
1887.	2,139,640	603,355	308,432	.....	.....	2,184,279	5,235,706
1888.	1,403,700	609,827	289,891	279,769	.....	2,034,162	4,617,349
1889.	1,522,204	716,496	259,409	363,851	.....	2,374,968	5,236,928
1890.	1,885,307	809,981	251,828	457,099	.....	2,618,660	6,022,875
1891.	1,307,176	678,927	223,312	536,607	.....	2,644,941	5,390,963
1892.	1,551,844	751,460	201,242	627,829	453,957	2,579,482	6,165,814
1893.	1,136,458	674,345	136,113	537,272	387,307	2,104,190	4,975,685
1894.	1,021,772	682,900	108,202	673,402	360,305	1,795,570	4,642,211
1895.	1,306,135	991,459	95,085	791,130	517,920	2,487,845	6,189,574
1896.	1,122,010	965,776	72,137	623,986	495,571	2,236,361	5,515,841
1897.	1,647,892	1,207,286	94,054	970,736	583,790	2,497,970	7,001,728
1898.	1,981,241	1,448,301	70,188	1,071,683	702,197	3,239,760	8,513,370
1899.	2,272,700	1,903,505	85,015	1,036,398	850,376	4,146,425	10,294,419
1900.	2,385,682	1,794,528	70,245	846,291	815,161	3,575,536	9,487,443
1901.	2,874,639	2,254,425	68,850	1,365,934	1,013,150	4,772,329	12,349,327
1902.	2,947,933	2,665,409	72,936	1,574,293	1,300,326	5,383,219	13,944,116
1903.	2,992,477	2,599,665	64,102	1,503,455	1,095,813	4,952,185	13,207,697
1904.	2,284,711	2,421,398	61,601	1,699,028	949,146	4,597,497	12,013,381
1905.	3,375,929	3,532,230	64,542	1,808,688	1,660,519	6,398,107	16,840,015
1906.	3,977,887	4,182,156	54,211	1,871,614	2,118,772	7,383,828	19,588,468
1907.	3,633,654	4,248,832	52,027	2,017,583	1,940,352	7,972,374	19,864,822
1908.	1,921,015	2,649,693	45,747	1,816,949	1,083,181	4,311,608	11,828,193
1909.	3,023,845	4,234,346	63,746	2,335,685	2,275,562	7,711,506	19,644,690
1910.	3,636,031	4,955,484	45,294	2,241,830	2,266,890	8,476,750	21,621,279
1911.	2,822,790	4,488,049	48,522	2,450,453	1,912,367	7,316,990	19,039,171
1912.	3,327,915	5,875,080	45,331	2,653,553	2,846,487	9,908,475	24,656,841
1913.	3,502,780	5,751,037	37,503	2,464,807	3,004,972	10,030,144	24,791,243
1914.	1,945,095	4,719,246	38,573	2,431,714	2,031,124	7,204,444	18,370,196
1915.	2,204,203	6,077,694	31,929	3,095,907	2,437,003	10,546,188	24,392,924
1916.	2,854,518	7,453,980	30,088	3,518,746	3,029,964	15,493,093	32,380,289
1917.	2,944,161	8,267,616	22,864	3,137,138	3,110,000	15,585,921	33,067,700

Rolled blooms and billets for forging purposes are included from 1905, while semi-finished products rolled for export are included for 1912 and subsequent years. Prior to 1892 structural shapes were included in "all other finished rolled products."

PRODUCTION OF FINISHED ROLLED PRODUCTS, SHOWING IRON AND STEEL PRODUCTS SEPARATELY, GROSS TONS, 1906–1917.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1906.	2,186,557	17,401,911	19,588,468	1912.	1,637,582	23,019,259	24,656,841
1907.	2,200,086	17,664,736	19,864,822	1913.	1,678,257	23,112,986	24,791,243
1908.	1,238,449	10,589,744	11,828,193	1914.	1,167,776	17,202,420	18,370,196
1909.	1,709,431	17,935,259	19,644,690	1915.	1,294,833	23,098,091	24,392,924
1910.	1,740,156	19,881,123	21,621,279	1916.	1,822,571	30,557,818	32,380,389
1911.	1,460,615	17,578,556	19,039,171	1917.	1,867,757	31,199,943	33,067,700

PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, BY STATES, GROSS TONS, 1913–1917.

States.	1913.	1914.	1915.	1916.	1917.
Maine, Massachusetts	178,782	139,179	184,273	217,589	218,962
Rhode Island, Conn.	78,604	55,265	66,455	75,111	81,255
New York	1,036,606	681,655	994,334	1,322,988	1,492,769
New Jersey	194,153	143,357	181,017	235,739	238,972
Pennsylvania	12,195,709	9,070,085	11,992,840	15,428,563	15,018,871
Delaware, Virginia	35,594	28,705	25,647	37,337	62,403
Maryland	324,091	170,723	220,725	385,708	368,458
West Virginia	561,535	456,108	534,134	777,328	831,594
Kentucky, North Car.	140,494	151,422	169,571	332,797	322,444
Tennessee, Ga., Texas	74,074	61,229	73,139		
Alabama	540,171	413,654	556,222	856,445	884,500
Ohio	4,259,813	3,491,464	4,733,612	5,846,024	6,141,465
Indiana	2,135,962	1,512,486	2,104,072	2,919,004	3,135,689
Illinois	2,248,638	1,444,270	1,889,964	2,686,674	2,713,428
Michigan	41,324	11,379	21,518	471,802	696,605
Wisconsin, Minnesota	209,325	119,422	157,575		
Missouri, Okla., Kansas	97,596	49,473	81,042	150,603	146,386
Colorado, Utah, Wash.	385,689	325,343	356,924	518,043	573,660
California	53,083	44,977	49,860	118,634	140,239
Total	24,791,243	18,370,196	24,392,924	32,380,389	33,067,700

PRODUCTION OF FINISHED ROLLED IRON AND STEEL BY LEADING PRODUCTS, GROSS TONS, 1917.

Products.	Iron.	Steel.	Total.
Rails	.....	2,944,161	2,944,161
Plates and sheets	29,071	8,238,545	8,267,616
Nail and spike plate	383	22,481	22,864
Wire rods	2,287	3,134,851	3,137,138
Structural shapes	1,410	3,108,590	3,110,000
Merchant bars	983,926	5,226,031	6,209,957
Bars for reinforced concrete work	1,497	469,687	471,184
Skelp, flue, and pipe iron or steel	336,591	2,337,640	2,674,231
Long angle splice bars, tie-plate bars, etc.	70,651	536,173	606,824
Hoops	.....	347,186	347,186
Bands and cotton-ties	1,807	489,086	490,893
Rolled sheet piling, not including fabricated	.....	18,606	18,606
Railroad ties	.....	9,103	9,103
Rolled forging blooms, forging billets, etc.	221	1,801,487	1,801,708
Exports of blooms, billets, sheet bars, etc.	2,343	1,156,084	1,158,427
All other finished rolled products	437,570	1,360,232	1,797,802
Total ..... Gross tons	1,867,757	31,199,943	33,067,700

In addition to the 18,606 tons of rolled sheet piling above reported, there were produced by rolling mills and steel works in 1917 about 5,294 tons of fabricated sheet piling, as compared with 4,848 tons of the same kind of piling in 1916.

PRODUCTION OF FINISHED ROLLED FORMS BY STATES, 1916–1917, SHOWING IRON AND STEEL SEPARATELY.

States.	1916—Gross tons.			1917—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Me., Mass.	22,851	194,738	217,589	24,215	194,747	218,962
R. I., Conn.	15,324	59,787	75,111	9,489	71,766	81,255
New York	74,559	1,248,429	1,322,988	82,716	1,410,053	1,492,769
New Jersey	39,387	196,352	235,739	40,543	198,429	238,972
Pennsylvania	829,108	14,599,455	15,428,563	793,551	14,225,320	15,018,871
Delaware, Va.	23,298	14,039	37,337	27,058	35,345	62,403
Maryland	3,456	382,252	385,708	2,511	365,947	368,458
West Virginia	.....	777,328	777,328	1,642	829,952	831,594
Ky., Tenn., N. C., Ga., Tex.	42,325	290,472	332,797	51,229	271,215	322,444
Alabama	14	856,431	856,445	1,022	883,478	884,500
Ohio	176,306	5,669,718	5,846,024	192,418	5,949,047	6,141,465
Indiana	274,651	2,644,353	2,919,004	306,504	2,829,185	3,135,689
Illinois	147,830	2,538,844	2,686,674	175,528	2,537,900	2,713,428
Mich., Wis., Mn.	.....	471,802	471,802	.....	696,605	696,605
Mo., Okla., Kan.	117,972	32,631	150,603	112,265	34,121	146,386
Colorado, Utah, Washington	23,970	494,073	518,043	30,224	543,436	573,660
California	31,520	87,114	118,634	16,842	123,397	140,239
Total	1,822,571	30,557,818	32,380,389	1,867,757	31,199,943	33,067,700

Of the total production of 1917, 94.3 per cent. was rolled from steel, as compared with about 94.4 per cent. in 1916.

Of the total production in 1917, 45.42 per cent. was rolled in Pennsylvania, as compared with 47.65 per cent. in 1916; and in 1917, 18.57 per cent. was rolled in Ohio, as compared with 18.05 per cent. in the previous year.

In 1917 there were 385 plants in 29 States which rolled finished forms of iron or steel, as compared with 370 plants in 30 States in 1916.

PRODUCTION OF PLATES AND SHEETS.

PRODUCTION OF IRON AND STEEL PLATES AND SHEETS, 1888–1917.

Years.	Gross tons.	Years	Gross tons.	Years.	Gross tons.
1888	609,827	1898	1,448,301	1908	3,949,693
1889	716,496	1899	1,903,505	1909	4,234,345
1890	809,981	1900	1,794,528	1910	4,955,484
1891	678,927	1901	2,254,425	1911	4,488,949
1892	751,460	1902	2,665,409	1912	5,875,080
1893	674,345	1903	2,599,665	1913	5,731,037
1894	682,900	1904	2,421,398	1914	4,719,246
1895	991,459	1905	3,532,230	1915	6,077,694
1896	965,776	1906	4,182,156	1916	7,453,980
1897	1,207,286	1907	4,248,832	1917	8,267,616

PRODUCTION OF PLATES AND SHEETS BY KINDS, 1916–1917.

Kinds.	1916—Gross tons.			1917—Gross tons.		
	Iron.	Steel	Total.	Iron.	Steel.	Total.
Universal plates	4,015	1,220,219	1,224,234	5,975	1,189,224	1,195,199
Sheared plates—						
Rolled on single stands	1,463	1,981,400	1,982,863	2,025	2,394,340	2,396,365
Roughed and fin. on sep. stands	.....	470,287	470,287	.....	566,674	566,674
Black sheets made on sheet or job. mills	5,947	2,243,650	2,249,597	20,416	2,347,336	2,367,752
Black plates, inc. black plates for tinning and black plate specialties rolled on tin mills	1,878	1,525,121	1,526,999	655	1,740,971	1,741,626
Total	13,303	7,440,677	7,453,980	29,071	8,238,545	8,267,616

PRODUCTION OF PLATES AND SHEETS BY SIZE AND MODE OF MANUFACTURE, GROSS TONS, 1917.

Kinds of products.	Iron.	Steel.	Total.
Universal plates, inc. flats or bars over 6 in. wide:			
¼ of an inch and over in thickness	5,975	1,142,939	1,148,914
Under ¼ of an inch thick	....	46,285	46,285
Total universal plates	5,975	1,189,224	1,195,199
Sheared plates:			
¼ of an inch and over in thickness	1,824	2,460,114	2,461,938
Under ¼ of an inch thick	201	500,900	501,101
Total sheared plates	2,025	2,961,014	2,963,039
Black sheets, made on either sheet or job. mills:			
No. 12 gauge and thicker	715	354,624	355,339
No. 13 gauge and thinner	19,701	1,992,712	2,012,413
Total black sheets	20,416	2,347,336	2,367,752
Black plates rolled on tin mills:			
Black plates for tinning	655	1,513,117	1,513,772
Other black plate specialties	.....	227,854	227,854
Total black plates rolled on tin mills	655	1,740,971	1,741,626
Grand total of plates and sheets	29,071	8,238,545	8,267,616

PRODUCTION OF SHEARED PLATES ACCORDING TO MODE OF MANUFACTURE, GROSS TONS, 1917.

Mode of manufacture.	Iron.	Steel.	Total.
Sheared plates, rolled on single stands of rolls:			
¼ of an inch and over in thickness	1,824	2,187,925	2,189,749
Under ¼ of an inch thick	201	206,415	206,616
Total rolled on single stands	2,025	2,394,340	2,396,365
Sheared plates, roughed and fin. on sep. stands:			
¼ of an inch and over in thickness	...	272,189	272,189
Under ¼ of an inch thick	...	294,485	294,485
Total roughed and fin. on sep. stands	...	566,674	566,674
Total sheared plates	2,025	2,961,014	2,963,039

PRODUCTION OF UNIVERSAL PLATES BY WIDTHS, SHOWING IRON AND STEEL SEPARATELY, GROSS TONS, 1917.

Width of universal plates.	Iron.	Steel.	Total.
Under 30 inches wide	5,975	978,458	984,433
30 inches wide, but under 48 inches wide	...	170,900	170,900
48 inches wide and over	...	39,866	39,866
Total	5,975	1,189,224	1,195,199

PRODUCTION OF IRON AND STEEL BLACK PLATES FOR TINNING, 1895–1917.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1895	129,615	1903	490,652	1911	795,598
1896	185,387	1904	472,569	1912	982,197
1897	271,886	1905	507,587	1913	827,266
1898	345,254	1906	576,079	1914	938,181
1899	375,000	1907	504,072	1915	1,093,345
1900	315,000	1908	513,771	1916	1,283,802
1901	398,026	1909	606,482	1917	1,513,772
1902	365,743	1910	712,137		

PRODUCTION OF BLACK PLATES FOR TINNING, SHOWING IRON AND STEEL SEPARATELY, GROSS TONS, 1904–1917.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1904	2,981	469,588	472,569	1911	3,515	792,083	795,598
1905	3,152	504,435	507,587	1912	5,378	976,819	982,197
1906	5,666	570,413	576,079	1913	2,779	824,487	827,266
1907	3,161	500,911	504,072	1914	2,272	935,909	938,181
1908	2,954	510,817	513,771	1915	2,038	1,091,307	1,093,345
1909	4,261	602,221	606,482	1916	1,878	1,281,924	1,283,802
1910	2,893	709,244	712,137	1917	655	1,513,117	1,513,772

Similar statistics for earlier years are not available. In 1917, 32 works made black plates for tinning.

PRODUCTION OF NAIL PLATE.

PRODUCTION OF IRON AND STEEL NAIL PLATE, 1888–1917.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1888	289,891	1896	72,137	1904	61,601	1912	45,331
1889	259,409	1897	94,054	1905	64,542	1913	37,503
1890	251,828	1898	70,188	1906	54,211	1914	38,573
1891	223,312	1899	85,015	1907	52,027	1915	31,929
1892	201,242	1900	70,245	1908	45,747	1916	30,088
1893	136,113	1901	68,850	1909	63,746	1917	22,864
1894	108,262	1902	72,936	1910	45,294	.....	.....
1895	95,085	1903	64,102	1911	48,522	.....	.....

Seven plants in 5 States rolled iron or steel nail or spike plate in 1917, against 8 plants in 5 States in 1916.

PRODUCTION OF WIRE RODS.

PRODUCTION OF WIRE RODS, GROSS TONS, 1888–1917.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1888	279,769	1896	623,986	1904	1,699,028	1912	2,653,553
1889	363,851	1897	970,736	1905	1,808,688	1913	2,464,807
1890	457,099	1898	1,071,683	1906	1,871,614	1914	2,431,714
1891	536,607	1899	1,036,398	1907	2,017,583	1915	3,095,907
1892	627,829	1900	846,291	1908	1,816,949	1916	3,518,746
1893	537,272	1901	1,365,934	1909	2,335,685	1917	3,137,138
1894	673,402	1902	1,574,293	1910	2,241,830	.....	.....
1895	791,130	1903	1,503,455	1911	2,450,453	.....	.....

Small quantities of copper-clad steel wire rods are included.

PRODUCTION OF STRUCTURAL SHAPES.

PRODUCTION OF STRUCTURAL SHAPES, GROSS TONS, 1892–1917.

Years.	Tons.	Years.	Tons.	Years.	Tons.
1892	453,957	1901	1,013,150	1910	2,266,890
1893	387,307	1902	1,300,326	1911	1,912,367
1894	360,305	1903	1,095,813	1912	2,846,487
1895	517,920	1904	949,146	1913	3,004,972
1896	495,571	1905	1,660,519	1914	2,031,124
1897	583,790	1906	2,118,772	1915	2,437,003
1898	702,197	1907	1,940,352	1916	3,029,964
1899	850,376	1908	1,083,181	1917	3,110,000
1900	815,161	1909	2,275,562	.....	.....

PRODUCTION OF HEAVY AND LIGHT STRUCTURAL SHAPES, GROSS TONS, 1912–1917.

Years	Heavy shapes	Light shapes	Total
1912	2,470,415	376,072	2,846,487
1913	2,553,806	451,166	3,004,972
1914	1,787,281	243,843	2,031,124
1915	2,031,407	405,596	2,437,003
1916	2,649,961	380,003	3,029,964
1917	2,575,810	534,190	3,110,000

All the heavy structural shapes were rolled from steel.

PRODUCTION OF MERCHANT BARS.

PRODUCTION OF MERCHANT BARS, SHOWING IRON AND STEEL MERCHANT BARS SEPARATELY, GROSS TONS, 1905–1917.

Years.	Iron.	Steel.	Total	Years.	Iron.	Steel.	Total.
1905	1,322,439	2,271,162	3,593,601	1912	944,790	2,752,324	3,697,114
1906	1,481,348	2,510,852	3,992,200	1913	1,026,632	2,930,977	3,957,609
1907	1,440,356	2,530,632	3,970,988	1914	563,171	1,960,460	2,523,631
1908	685,233	1,301,405	1,986,638	1915	657,107	3,474,135	4,131,242
1909	952,230	2,311,301	3,263,531	1916	903,948	5,236,354	6,230,302
1910	1,074,163	2,711,568	3,785,731	1917	983,926	5,226,031	6,209,957
1911	835,625	2,211,737	3,047,362	.....	.....	.....	.....

PRODUCTION OF CONCRETE BARS.

PRODUCTION OF CONCRETE BARS, SHOWING IRON AND STEEL CONCRETE BARS SEPARATELY, GROSS TONS, 1909–1917

Years.	Iron.	Steel.	Total	Years.	Iron.	Steel.	Total.
1909	.....	159,352	159,352	1914	.....	288,471	288,471
1910	4,645	236,464	241,109	1915	.....	353,408	353,408
1911	2,388	256,353	258,741	1916	2,683	458,717	461,400
1912	2,500	271,832	274,332	1917	1,497	469,687	471,184
1913	113	319,557	319,670	.....	.....	.....	.....

Statistics are not available prior to 1909.

PRODUCTION OF SKELP.

PRODUCTION OF SKELP, SHOWING IRON AND STEEL SKELP SEPARATELY, GROSS TONS, 1905–1917.

Years.	Iron.	Steel.	Total	Years.	Iron.	Steel.	Total.
1905	452,797	983,198	1,435,995	1912	327,012	2,119,804	2,446,816
1906	391,517	1,137,068	1,528,585	1913	312,746	2,189,218	2,501,964
1907	444,536	1,358,091	1,802,627	1914	264,340	1,718,091	1,982,431
1908	297,049	853,534	1,150,583	1915	262,198	2,037,266	2,299,464
1909	370,151	1,663,230	2,033,381	1916	355,445	2,572,229	2,927,674
1910	350,578	1,477,616	1,828,194	1917	336,591	2,337,640	2,674,231
1911	322,397	1,658,276	1,980,673	.....	.....	.....	.....

In 1917, 41 plants in 6 States rolled iron or steel skelp, as compared with 45 works in 5 States in 1916.

PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS.

PRODUCTION OF MISCELLANEOUS ROLLED IRON AND STEEL PRODUCTS, GROSS TONS, 1917.

Miscellaneous rolled products.	Iron.	Steel.	Total.
Hoops	.....	347,186	347,186
Bands and cotton-ties	1,807	489,086	490,893
Long angle splice bars, fish-plate bars, tie-plate bars, and other rail joint shapes	70,651	536,173	606,824
Rolled sheet piling, not including fabricated	.....	18,606	18,606
Railroad ties	.....	9,103	9,103
Rolled forging blooms, forging billets, etc	221	1,801,487	1,801,708
Blooms, billets, sheet bars, etc., for export	2,343	1,156,084	1,158,427
Spike and chain rods, bolt and nut rods, horseshoe bars, strips, etc	437,570	1,360,232	1,797,802
Total	512,592	5,717,957	6,230,549

PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS, GROSS TONS, 1913–1917.

Products.	1913.	1914.	1915.	1916.	1917.
Hoops	280,886	211,028	281,759	368,164	347,186
Bands and cotton-ties	499,660	345,919	437,987	562,555	490,893
Long angle splice bars, fish-plate bars, tie-plate bars, etc	686,390	423,052	535,615	691,820	606,824
Rolled sheet piling	46,289	35,314	24,026	19,196	18,606
Railroad ties	44,244	33,249	42,269	34,311	9,103
Rolled forging blooms and forging billets	537,210	331,524	650,545	2,015,960	1,801,708
Blooms, billets, sheet bars, tinplate bars, etc., for export	88,778	91,907	562,418	512,483	1,158,427
Spike and chain rods, bolt and nut rods, horseshoe bars, strips, shafting, tires, etc	1,067,444	937,918	1,227,455	1,669,228	1,797,802
Total	3,250,901	2,409,911	3,762,074	5,873,717	6,230,549

PRODUCTION OF MISCELLANEOUS IRON AND STEEL PRODUCTS IN THE UNITED STATES, 1917.

PRODUCTION OF TINPLATES AND TERNE PLATES.

PRODUCTION OF TINPLATES AND TERNE PLATES, 1891–1917.

Years.	Tinplates.	Terne plates.	Total pounds
1891 (second 6 months)	368,400	1,868,343	2,236,743
1892 (calendar year)	13,921,296	28,197,896	42,119,192
1893	64,536,209	59,370,498	123,606,707
1894	102,223,407	64,120,002	166,343,409
1895	165,927,907	88,683,488	254,611,395
1896	270,151,785	89,058,013	359,209,798
1897 (first 6 months)	203,028,258	49,545,643	252,573,901
1897 (second 6 months)	.....	.....	322,205,619
1898 (calendar year)	.....	.....	732,289,600
1899	.....	.....	808,360,000
1900 (cen. year end. May 31)	707,718,239	141,285,783	*850,004,495
1901 (calendar year)	.....	.....	894,411,840
1902	.....	.....	806,400,000
1903	.....	.....	1,075,200,000
1904 (cen. year end. Dec. 31)	867,526,985	158,857,866	*1,032,940,706
1905 (calendar year)	.....	.....	1,105,440,000
1906	1,100,373,000	193,367,000	1,293,740,000
1907	996,650,000	156,447,000	1,153,097,000
1908	1,048,896,000	154,179,000	1,203,075,000
1909	1,179,858,000	190,930,000	1,370,788,000
1910	1,450,821,000	168,184,000	1,619,005,000
1911	1,597,629,000	158,441,000	1,756,070,000
1912	1,965,659,000	191,396,000	2,157,055,000
1913	1,708,185,000	136,944,000	1,845,130,000
1914	1,939,785,000	146,195,000	2,085,980,000
1915	2,201,825,054	163,470,646	2,365,295,700
1916	2,552,224,275	214,176,952	2,766,401,227
1917	3,233,314,911	153,891,653	3,387,206,564

* Includes 1,000,473 pounds in 1900 and 6,555,853 pounds in 1901 of "other sheet iron and sheet steel, tin or terne plated."

PRODUCTION OF COKE AND CHARCOAL TINPLATES, 1917.

States.	Coke. Pounds.	Charcoal Pounds.	Total. Pounds.
Pennsylvania	1,614,060,292	23,183,330	1,637,243,622
Maryland, West Virginia	529,260,003	34,788,354	564,048,357
Ohio, Indiana, Ill., Michigan	1,023,396,570	8,626,362	1,032,022,932
Total	*3,166,716,865	66,598,046	3,233,314,911

* Includes 9,300,000 pounds which were formed or stamped from black plates by companies which manufacture tinplates and tinned after the completion of the forming or stamping process.

PRODUCTION OF FINISHED ANGLE SPLICE BARS, TIE PLATES, FISH PLATES, ETC., BY ROLLING MILLS AND STEEL WORKS.

PRODUCTION OF RAIL JOINTS AND FASTENINGS, 1916–1917.

Articles.	1916—Gross tons.			1917—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Angle splice bars	3,090	159,612	162,702	4,453	177,504	181,957
Tie plates	60,447	264,271	324,718	55,148	193,977	249,125
Fish plates	300	22,602	22,902	791	20,513	21,304
Other rail joints	1,273	90,514	91,787	84	76,933	77,017
Total	65,110	536,999	602,109	60,476	468,927	529,403

PRODUCTION OF FORGED IRON AND STEEL BY ROLLING MILLS AND STEEL WORKS.

Years.	Production—Gross tons.			Years.	Production—Gross tons.		
	Iron.	Steel.	Total.		Iron.	Steel.	Total.
1908	13,646	117,497	131,143	1913	27,892	380,091	407,983
1909	25,523	223,741	249,264	1914	3,675	337,746	341,421
1910	20,410	299,452	319,862	1915	2,814	520,909	523,723
1911	4,034	214,202	218,236	1916	3,352	920,415	923,767
1912	9,155	383,365	392,520	1917	8,772	1,069,993	1,078,765

PRODUCTION OF GALVANIZED SHEETS.

PRODUCTION OF IRON AND STEEL GALVANIZED SHEETS.

Products.	1917—Pounds.		
	Iron.	Steel.	Total.
Galvanized sheets	24,114,304	1,249,864,501	1,273,978,805
Galvanized formed products*	709,487	114,192,684	114,902,171
Total	24,823,791	1,364,057,185	1,388,880,976
Products.	**1916—Pounds.**		
	Iron.	**Steel.**	**Total.**
Galvanized sheets	2,026,494	1,344,898,456	1,346,924,950
Galvanized formed products*	1,051,482	129,250,713	130,302,195
Total	3,077,976	1,474,149,169	1,477,227,145

* Articles formed or stamped from iron or steel black plates or black sheets and galvanized after the completion of the forming or stamping process.

PRODUCTION OF CUT AND WIRE NAILS.

PRODUCTION OF WIRE NAILS IN 100-LB. KEGS, 1888–1917.

Years.	Production.	Exports.	Consumption.	Years.	Production.	Exports.	Consumption.
1888	1,500,000	13,414	1,486,586	1903	9,631,661	704,546	8,927,115
1889	2,435,000	19,172	2,415,828	1904	11,926,661	734,554	11,192,107
1890	3,135,911	18,395	3,117,516	1905	10,854,892	799,734	10,055,158
1891	4,114,385	18,986	4,095,399	1906	11,486,647	1,035,705	10,450,942
1892	4,719,524	21,387	4,698,137	1907	11,731,044	945,035	10,786,009
1893	5,095,945	27,451	5,068,494	1908	10,662,972	593,819	10,069,153
1894	5,681,801	38,920	5,642,881	1909	13,916,053	686,687	13,229,366
1895	5,841,403	53,012	5,788,391	1910	12,704,902	960,295	11,744,607
1896	4,719,860	95,638	4,624,222	1911	13,437,778	1,200,957	12,236,821
1897	8,997,245	129,767	8,867,478	1912	14,659,700	1,530,353	13,129,347
1898	7,418,475	307,190	7,111,285	1913	13,559,727	977,477	12,582,250
1899	7,618,130	750,781	6,867,349	1914	13,132,814	809,167	12,323,647
1900	7,233,979	613,858	6,620,121	1915	14,583,026	2,051,475	12,531,551
1901	9,803,822	420,506	9,383,316	1916	17,147,665	3,363,876	13,783,789
1902	10,982,246	595,391	10,386,855	1917	17,040,666	2,574,048	14,466,618

PRODUCTION OF CUT NAILS IN 100-LB. KEGS, 1888–1917.

Years.	Production.	Exports.	Consumption.	Years.	Production.	Exports.	Consumption.
1888	6,493,591	121,606	6,371,985	1903	1,435,893	199,126	1,236,767
1889	5,810,758	117,967	5,692,791	1904	1,283,362	207,720	1,075,642
1890	5,640,946	134,374	5,506,572	1905	1,357,549	176,741	1,180,808
1891	5,002,176	103,836	4,898,340	1906	1,189,239	169,519	1,019,720
1892	4,507,819	152,686	4,355,133	1907	1,109,138	155,212	953,926
1893	3,048,933	131,910	2,917,023	1908	956,182	157,319	798,863
1894	2,425,060	183,229	2,241,831	1909	1,207,597	222,565	985,032
1895	2,129,894	176,394	1,953,500	1910	1,005,233	182,087	823,146
1896	1,615,870	237,088	1,378,782	1911	967,636	255,854	711,782
1897	2,106,799	337,732	1,769,067	1912	978,415	208,568	769,847
1898	1,572,221	352,473	1,219,748	1913	842,038	84,885	757,153
1899	1,904,340	223,425	1,680,915	1914	769,665	76,676	692,989
1900	1,573,494	250,053	1,323,441	1915	775,327	94,878	680,449
1901	1,542,240	208,359	1,333,881	1916	764,835	106,451	658,384
1902	1,633,762	161,228	1,472,534	1917	461,674	101,408	360,266

PRODUCTION OF PIPES AND TUBES.

PRODUCTION OF WROUGHT IRON AND STEEL PIPE AND BOILER TUBES, 1916–1917.

Kinds of pipe.	1916—Gross tons.			1917—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Black, standard	110,694	1,021,949	1,132,643	90,119	969,628	1,059,747
Galvanized	28,540	262,473	291,013	25,949	249,356	275,305
Oil country goods	85,805	854,686	940,491	102,337	785,566	887,903
O. D. and misc.	136	138,627	138,763	90	115,600	115,690
Boiler tubes	52,942	95,206	148,148	55,395	92,937	148,332
Total	278,117	2,372,941	2,651,058	273,890	2,213,087	2,486,977

PRODUCTION OF SEAMLESS STEEL TUBES, 1916–1917.

The production of seamless steel tubes in 1917 amounted to 226,675 gross tons, against 190,473 tons in 1916, an increase of 36,202 tons, or 19.01 per cent. Of the total in 1917, 87,615 tons were hot-finished and 139,060 tons were cold-drawn, against 61,235 tons of hot-finished and 129,238 tons of cold-drawn tubes in 1916.

PRODUCTION OF CAST IRON PIPE, NET TONS, 1916–1917.

Kinds of pipe.	1916—Net tons.			1917—Net tons.		
	Pipe.	Fittings.	Total.	Pipe.	Fittings.	Total.
Gas and water*	874,129	60,497	934,626	696,097	52,076	748,173
Soil and plumbers'	206,494	73,213	279,707	175,625	75,303	250,928
Total	1,080,623	133,710	1,214,333	871,722	127,379	999,101

* Includes culvert pipe. Manufacturers able to separate their production report 19,725 tons of culvert pipe in 1917 and 27,014 tons in 1916.

PRODUCTION OF HAMMERED CHARCOAL IRON BLOOMS, BILLETS, ETC.

Years.	For sale.	For own use.	Total. Gross tons.	Years.	For sale.	For own use.	Total. Gross tons.
1908	8,103	47,870	55,973	1913	80	59,313	59,393
1909	9,593	46,772	56,365	1914	5,026	36,399	41,425
1910	14,016	61,958	75,974	1915	902	42,219	43,121
1911	2,271	62,345	64,616	1916	5,405	75,280	80,685
1912	250	65,557	65,807	1917	7,841	81,284	89,125

President Wilson Favors Redfield Plan

Commission to Formulate Lower Prices Which Government Is Willing to Pay—William B. Dickson to Be Chief Adviser of Steel Industry

WASHINGTON, Feb. 18.—President Wilson has cabled his approval for the commission project initiated by Secretary Redfield of the Department of Commerce to formulate a program of lower prices to stimulate American industry. Because of the inability of several suggested members to serve on the commission, there has been delay in its final make-up.

Until the commission has been officially organized, Secretary Redfield and his advisers have made no effort to work out the actual program for the commission. It is still planned to begin operations in the steel industry, but even on this subject no further details have been announced. It is likely that William B. Dickson, vice-president Midvale Steel & Ordnance Co. and the special adviser of the steel industry for the Department, will be in charge of anything that is done in regard to steel prices.

George N. Peek, of Moline, Ill., former member of the War Industries Board, has been chosen by Secretary Redfield as chairman of the commission. Mr. Peek will select his associates.

Opposition to the Redfield plan developed in the Senate because of a fear that the commission might attempt to lower the prices of agricultural products. A number of Senators from the South, as well as from the Central States, cabled a protest to President Wilson against permitting anything which would interfere with the present prices of farm products. Apparently President Wilson paid no attention to these protests.

There seems to have been some basis for the Senatorial fears, however, for Secretary Redfield declared that the Government should stop its policy of attempting to maintain high farm prices, drop all efforts to keep up the wheat price and pay the farmers the difference between the guarantee and the actual market price. It is his belief that the maintenance of high food prices would be an important factor in contributing to the spread of Bolshevism.

Urging Building Activity

In the meantime, the Department of Labor continues to devote its attention to an attempt to increase the building activity throughout the country. Its information and education service has been conducting a vigorous propaganda in behalf of this program. It claims that these efforts have met with considerable success. However, it also has given publicity to a series of complaints from building authorities throughout the country assigning various causes for the delay in the resumption of building activity. Many of these, says the announcement of the Department of Labor, blame Congress, others charge the financial interests of the country with responsibility. In the Central West freight rates are said to be exerting an injurious influence. In the main, high costs of materials are held to be the chief obstacle, declares the statement.

Then it quotes "a well-known architect from Buffalo" as saying:

"Don't expect private capital to build merely for the sake of furnishing jobs for workmen. That is the obligation of the Government, be it local, State or National. Let public works be started at once for the benefit of the public. The cost will be high and the public will have to pay the price, but the public will reap the benefit in the reduction of unemployment, the absorption of the products of many industries and the use of many works of which there is great need."

From Passaic, N. J., it quotes the statement:

"I am greatly hindered in progress of this work by not being able to procure loans by way of mortgage, in large amounts, say in the neighborhood of $150,000. The banking institutions and mortgage companies are making only small loans around here, and even where there is ample security will not consider investing a large amount of money in one place."

Carefully buried in the same statement, it confesses, however, that labor conditions and demands also are blamed by many authorities for the delay in building operations. It quotes the following "typical" statement from a Lincoln, Neb., architect:

"Construction work in these parts is now and has been impeded not a little, due to the unreasonable demands of labor, not only for exorbitant wages but more by the fact that certain very undesirable trade rules are being enforced by labor organizations, which run up the cost of doing work enormously."

No General Advance

In response to the Department of Labor's inquiry as to future rates on building and construction materials, the United States Railroad Administration asserted there is to be no general 30 per cent advance on freight rates for sand, gravel, crushed stone and slag. The rumor that such advances were contemplated was arousing anxiety in the Central West. Under date of Jan. 20 the Railroad Administration put out a circular which says: "There is no foundation for the report that the Railroad Administration has given or is giving any consideration to any increase in present basis of rates."

The appeal of the Department concludes with the following eloquent paragraph:

"The Department of Labor points out that building, being a basic industry, will stimulate general business and is, therefore, very vital to continued financial prosperity. The national economic loss resulting from the idleness of thousands of men cannot be permitted and its injurious effects escaped. Present building costs are not so high that they equal in the aggregate the wealth of the country loses through the idleness following in the wake of building stagnation. Homes are needed, business quarters are needed, public works are needed! The United States is the wealthiest country in the world! The most reliable authorities in the country assert that unprecedented prosperity is ahead! Why longer delay the revival of building?"

In answer to the charge that lack of credit has hampered building trade activities Carter Glass, Secretary of the Treasury, issued the following statement:

"The impression seems to exist that policies initiated during the war by Secretary McAdoo and by the Federal Reserve Board for the conservation of credit are still fully effective and are responsible for inactivity in the building trades.

"My own impression is that inactivity in the building trades is directly traceable not to any insufficiency of credit, but to the continuance of abnormally high costs. The building trades of the country responded promptly to the view of my predecessor and of the Federal Reserve Board and co-operated in a patriotic way with the Government in its program for the conservation of credit during the period of the war, and I am glad to say that in my judgment there is now no valid reason why sufficient credit should not be made available for useful building operations."

O. F. S.

REOPEN FAR EAST TRADE

Commerce with Balkan Countries Now Possible —Ocean Freight Rate Revisions

WASHINGTON, Feb. 18.—The announcement of the Supreme Economic Council in Paris that trade relations have been reopened with Bulgaria as well as with the Turkish Empire both in Europe and Asia, does not weaken the blockade of the Central Powers. According to the announcement made here by the War Trade Board complete control will be maintained to make sure that none of the commerce permitted, either to Turkey or Bulgaria, will in any way inure to the benefit of the enemy or enemy interests. The decision to reopen commerce, however, with the two eastern members of the four central powers is the most extensive change that has been made in our foreign commerce since the armistice. The new rule also throws open the Dardanelles and consequently Rumania and all ports of the Black Sea. This will give us direct access to Southern Russia.

At the same time, the War Trade Board has announced the abandonment of the procedure of shipping preference to ports on the east coast of South America. According to the statement of the War Trade Board, there is now sufficient shipping to take care of all the cargo being offered or which is likely to be offered in the immediate future for those markets. Doing away with these shipping preferences will save the American exporter, interested in the South American trade, considerable inconvenience. The procedure which is being canceled was essential because of the necessity of having some method which would establish a priority system for various commodities. It was also announced by the War Trade Board that steamship companies have been instructed to disregard any outstanding preferences heretofore granted.

For our European commerce, however, there is still a shortage of 500,000 gross tons, according to the estimates of Chairman Edward N. Hurley of the United States Shipping Board. As a result, the board has asked the War Department, which now employs about 50 per cent of the American controlled tonnage, to release additional ships for commercial purposes. It has also asked Herbert C. Hoover, Relief Commissioner, to urge Great Britain to help in the European relief work. The original agreement for this task was that Great Britain would furnish 50 per cent of the tonnage. So far no British tonnage has been used and the American fleet has carried the burden of the relief.

There has been further revision of the freight rates but no serious reductions. Chairman Hurley denies that there has been any cutting of ocean shipping rates except to meet the reductions made by the British shipping interests. He declared, however, that the board would meet the rates made by Great Britain. The latest revision of the rates to European ports, from South Atlantic ports of the United States, includes a special rate of $20 per gross ton for steel to the United Kingdom, $28 per gross ton to Havre and Bordeaux, and $40 to Barcelona. With this exception and a dollar rate per 100 lb. on lead billets, spelter, sulphur and a few other items, the official schedule on cargo rates follows:

	Per 100 Lb.	Per Cu. Ft.
United Kingdom	$1.07½	0.54
Holland (Rotterdam)	1.33	0.70
Belgium (Antwerp)	1.33	0.70
France (Havre, Bordeaux)	1.33	0.70
(Marseilles, Cette)	1.68	0.90
Spain (Barcelona)	1.93	1.00
Italy (Genoa, Naples)	1.68	0.90

The latest rates from the United States North Atlantic ports to Europe follow:

Rotterdam, Antwerp, Havre and Bordeaux	$1.25 per 100 lb. or 0.65 per cu. ft., ship's option.
Marseilles, Cette, Genoa and Naples	1.60 per 100 lb. or 0.85 per cu. ft., ship's option.
Barcelona	1.85 per 100 lb. or 0.95 per cu. ft., ship's option.

J. R. Stone Tool & Supply Co., Detroit, will be the Michigan representative of the Advance Tool & Supply Co., Cincinnati, maker of reamers, milling cutters, and small tools.

Material Handling Machinery Manufacturers' Association Opens Office

The Material Handling Machinery Manufacturers' Association, which was recently organized to promote the interests of makers of material-handling machinery, has opened an office at 35 West Thirty-ninth Street, New York, in charge of Zenas W. Carter, who has been appointed managing executive of the association. The following are the members of the association, followed by names of executive members.

Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.	James A. Shepard
Brown Portable Conveying Machinery Co., Chicago	George W. Clark
Karry Lode Industrial Truck Co., Long Island City, N. Y.	J. M. Breitenback
Whiting Foundry Equipment Co., Harvey, Ill.	R. H. Bourne
Watson Elevator Co., New York	C. M. Watson
Edw. F. Terry Mfg. Co., New York	L. E. Vielhaber
International Conveyor Corp., New York	Fred C. Thornley
Wellman-Seaver-Morgan Co., Cleveland	Fred Stadelman
Rownson, Drew & Clydesdale, Inc., New York	Jos. L. Loretz
New Jersey Foundry & Machine Co., New York	Ethan N. Hescock
Alliance Machine Co., Alliance, Ohio	D. Kendall
Alfred Box & Co., Inc., Philadelphia	G. A. Mitchell
Meade-Morrison Mfg. Co., East Boston, Mass.	Compton D. Bray
Alvey-Ferguson Co., Cincinnati	John C. Walker
Heyl & Patterson, Inc., Pittsburgh	W. J. Patterson
Hayward Co., New York	C. F. Hutchings
American Hoist & Derrick Co., St. Paul, Minn.	H. W. Davis
Elwell-Parker Electric Co., New York	Lucian C. Brown
Sprague Electric Works, New York	F. W. Hall
Otis Elevator Co., New York	R. W. Scott
Cleveland Crane & Eng. Co., Wickliffe, Ohio	Paul Caldwell
Clyde Iron Works, Duluth, Minn	J. R. McGiffert
Ohio Locomotive Crane Co., Bucyrus, Ohio	C. F. Michall
Manning, Maxwell & Moore, Inc., New York	W. B. Clarke
Robbins Conveying Belt Co. New York	
Northern Engineering Co., Detroit	
Michener Stowage Co., New York	
Electric Controller & Mfg. Co., Cleveland	

Associate Members

Calvin Tomkins, New York
Charles A. Rohr, New York

Prices on Plates Cut in Navy Bids

WASHINGTON, Feb. 18.—The Navy Department today opened bids on plates required for battleships Nos. 49 and 50. The following bids were submitted on 9,700,000 lb. of medium steel plates, black rectangular, delivered Brooklyn, including a freight rate of 27c. per 100 lb. Brier Hill Steel Co., 3.37c.; Youngstown Sheet & Tube Co., 3.37c.; R. Y. Hofman, 3.22c.; Midvale Steel & Ordnance Co., 3.27c.; Carnegie Steel Co., 3.37c.; Jones & Laughlin Steel Co., 3c.; Alan Wood Iron & Steel Co., 3.37c.

On 1,400,000 lb. of flanged steel plates the following bids were received: Brier Hill Steel Co., 3.27c.; Youngstown Sheet & Tube Co., 3.52c.; R. Y. Hofman, 3.37c.; Midvale Steel & Ordnance Co., 3.27c.; Carnegie Steel Co., 3.52c.; Alan Wood Iron & Steel Co., 3.52c.

As will be noted, the Jones & Laughlin Steel Co. was the low bidder on the hull plates, its bid being equivalent to a Pittsburgh price of 2.73c. The Brier Hill Steel Co. and the Midvale Steel & Ordnance Co. were low bidders on the flanged steel plates, each putting in a bid of 3.27c., which is equivalent to a base price of 2.85c., Pittsburgh, as flange steel carries a 0.15c. extra.

Metallurgical Society Officers

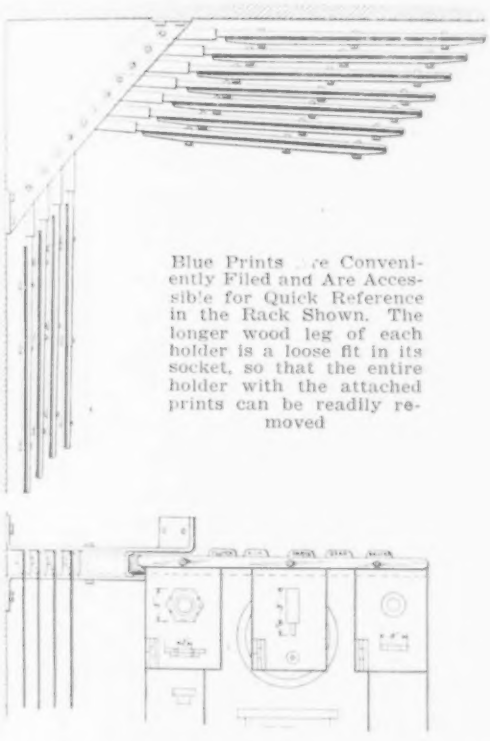
At a meeting of the Metallurgical Society of America held in the Fort Pitt Hotel, Pittsburgh, on Thursday evening, Feb. 13, the following officers were elected: D. L. Mathias, Mackintosh, Hemphill & Co., president; O. B. McMillen, Pittsburgh Rolls Corporation, first vice-president; C. I. Neidringhaus, Mesta Machine Co., second vice-president; W. Arthur Hall, Braddock Mfg. Co., secretary and treasurer; H. R. Connell, General Electric Co., and W. H. Seaman, Pittsburgh Rolls Corporation, directors. Plans were discussed and formulated whereby considerable of the co-operative research results in the metallurgical field during the war, may be presented to the public, and thus preserve that which otherwise might have been lost.

CORRESPONDENCE

Filing Rack for Blue Prints

To the Editor: One of the most difficult problems in an engineering office, drafting room or shop has been to obtain a filing rack for quick reference blue prints. The common filing cabinet has strong objections, as it is necessary to index each file, and it is also necessary in locating a complete assembly to go through an entire file of different sized drawings before an assembly is found. The illustration shows in detail a convenient and practical filing rack. It can be made in the average shop or factory at less cost than the average filing cabinet. The most convenient location is the corner of a room, as it is out of the way and occupies very little space. If used in a dusty factory, it may be desirable to make an oilcloth covering.

The sockets are made from steel tubing of 1⅝ in. outside diameter. A steel wedge is made tapered



Blue Prints Are Conveniently Filed and Are Accessible for Quick Reference in the Rack Shown. The longer wood leg of each holder is a loose fit in its socket, so that the entire holder with the attached prints can be readily removed

slightly, the tubing is heated and the wedge driven into the tubing.

Plain hexagon nuts are used on the holder in place of wing nuts to eliminate the convenience for the person that is in the habit of removing prints from the file without authority.

H. W. COPLEY.

Jersey City, N. J.

The Nullification of Honest Labor's Wishes

To the Editor:

When a rabid dog appears in our streets, his snarling nose indicating his desire to employ his vicious, uncovered teeth in endangering human life, self-protection cries out for prompt, decisive, vigorous action to put a stop to the threatened danger. To delay action until his intemperate frenzy has created a panic is idiotic. He should be killed before his biting propensity is demonstrated.

If this has the sound of infantile philosophy, one can with shallow research find its counterpart in the recent labor strike at Seattle, in which 75,000 men—more than two-thirds of the number of the I. W. W. and Bolshevik caliber—made of the Washington city a terror-stricken spot, peaceful Government helpless, hunger and idleness threatening unrestrained lawlessness.

It appears from Mayor Hanson's statement that the number of labor unionists has within the past two years been largely increased by the admission to membership in something over 150 unions of many of the I. W. W. and Bolshevik tribes, some of whom worked semi-occasionally, and some when they felt like it, just now and then, when stomach necessities were insistent. This increased membership, it seems, became the ruling power, and by outvoting was able to render the honest, conscientious members of the various lodges powerless to prevent the anarchistic action of their associates, who had unmasked and had become extremely undesirable.

The nauseating lesson of the defiance to law and order of the anarchistic element referred to is too plain to require comment. If the counterpart of the rabid dog shows even its snarling nose it is not wise to wait for an exhibition of its vicious teeth and demonstration of its poisonous proclivities—seize your weapons and use them before the biting begins.

L. P. THOMPSON.

Cincinnati, Feb. 11.

Wagner Electric Mfg. Co.'s War Work

Details of the munitions production of the Wagner Electric Mfg. Co., St. Louis, and much interesting information hitherto forbidden for military reasons are revealed in a recent interview with W. A. Layman, president of the company. Mr. Layman told how in the days when the German submarines were doing their greatest damage, depth bombs were shipped to the seaboard from St. Louis on fast passenger trains. During the first year of the war, he said, the War Department depended wholly on the Wagner company for the navy's supply of depth bombs.

Since 1915, Mr. Layman said, the Wagner company manufactured 85,000 8-in. howitzer shells for the British Government, 800,000 detonating fuses for the Russians, and contracted for 300,000 6-in. and 170,000 8-in. shells for the United States Government, a small part of which remain unfinished. Fifteen thousand detonating fuses, similar to the Russian type, were also delivered daily for American shells of large caliber.

The Wagner company also manufactured, jointly with another concern at Moline, Ill., more than 70 per cent of the 4-in. naval anti-submarine guns contracted for in the United States and 80,000 56-in. artillery wheel hubs, besides a vast amount of other articles and electrical machinery used by this country in the war.

More than 1500 men and women, additional to the regular production organization of 3000, were employed on war orders, and the payroll reached a maximum of $120,000 a week. Since hostilities ceased the Wagner company has virtually disbanded its munitions department, having let out about 1500 men and women workers, and is concentrating its resources on its electrical machine business.

Speaking of the Wagner company's achievement against the submarine, Mr. Layman said:

"On June 16, 1917, we were furnished with blueprint drawings for depth charges and two weeks later we shipped experimental models to an Eastern naval station, where tests showed them to function properly. We then received a telegraphic order for quantity production, and soon thereafter regular shipments were started. At one time the U-boat menace was so critical that we shipped these bombs, not containing explosives, on fast passenger trains to the East. During this period a baggage car full of depth bombs left our plant each night under special naval guard, and was attached to a passenger train."

The Carnegie Steel Co. has installed a dry gas washer on No. 1 blast furnace in the Ohio works battery, Youngstown, Ohio, the invention of Fred E. Kling, chief mechanical engineer, and Luther B. Weidlein, steam engineer. It is claimed the washer cleans the gas just as effectively as by the wet washing method, without reducing the temperature.

ESTABLISHED 1855

THE IRON AGE

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Progress of Readjustment

The subject of most interest to all business men is the progress of readjustment. Men want to know how rapidly we are passing through the transitionary period which must bridge the gap from war time to normal peace time conditions. A difficulty in appraising the situation is the lack of a standard with which comparison can be made. Men do not know how much readjustment is necessary until the existing circumstances may be regarded as normal.

The more common view, probably, has been that certain definite things were necessary to occur; that, for instance, it would be necessary for commodity prices and wage rates to drop by certain amounts. The amount might not be known in advance, but it would be necessary that the decline, whatever fate had decreed its extent should be, would have to occur before normal, safe and sound conditions arrived.

Perhaps that was not the right viewpoint after all. Possibly the true measure is psychological rather than physical. Perhaps what is decreed is that men's minds must go through certain psychological reactions, whereupon men will act irrespective of the physical changes that have chanced to occur. For illustration, the investor, upon whom so much is recognized to depend, may not have a predetermined level to which he insists the cost of construction must descend until he is willing to act. It may be that his acting will be due simply to his growing tired of waiting. The workman, again, supposed to have made up his mind that his wage rate positively must not be altered, no matter what occurs, may, after the lapse of time and observance of various developments, become through an altered mental state quite ready to accept wage reductions which are in keeping with the new developments, including declines in the cost of living and observed refusal of capital to flow into construction investments without a decrease in their costs.

It is a fact in human affairs that these changes from activity to idleness and the reverse are not based wholly upon physical conditions but are really influenced to a large extent by mental states. In a time of inactivity, men grow tired of the condition and start something. In a time of activity, an idea arises that perhaps all is not well, or that the activity has lasted as long as it should be expected to last, and men become conservative, the idea spreading and gathering strength.

In the long run, business is governed by economic influences, but not week to week or month by month. Men's minds frequently run contrary to the dictates of sound economics, because they are minds and not machines, and the economic influence is eventually asserted by effecting a readjustment. Conditions swerve too far from the line that economic principles would dictate, and then the righting occurs. It is not to be expected, therefore, that at this time a business situation, as to the volume of activity, the level of prices and the scale of wages, will be developed that is in precise accord with the dictates of economic principles. According as men's minds act, readjustment in prices and wages might go too far, requiring eventually a swing in the opposite direction, or on the other hand readjustment might not go far enough to make the situation sound for a period of many years, and an inflated basis might be preserved for a period of years, inviting eventually the inevitable reaction.

To state the matter in another way, if there is going to be a period of extreme depression within the next twelvemonth it will mean that readjustment is going to go too far, while if on the other hand there is going to be a period of depression five years or seven years hence, it will mean that at this time the readjustment is not going to be carried far enough. If the experience after the Civil War is a criterion, the latter will occur. Business will resume in full swing before enough deflation has occurred to make conditions sound for a period of many years. The mental state will swerve men from the conduct that would be dictated by strict economic considerations.

Manganese and a Tariff

A new industry, vital to the steel interests of the country, faces serious conditions. Its interests deserve the earnest consideration of manufacturers and possibly legislators. Early in the war, sharp concern was entertained as to the manganese supplies of the steel industry, but after over four years of warfare that industry finds itself independent entirely of foreign supplies of ferromanganese. The country has on its hands a new industry, the development of which has been one of the surprises of the war. From a domestic output of less than 10,000 tons per month in 1913, it grew to nearly

29,000 tons per month in 1918, or an expansion of almost 300 per cent as shown by data on another page of this issue. To-day the supply of manganese-iron alloys is in excess of demand with production still on a large scale, the ferromanganese output in January having been over 21,000 tons.

Opinion is almost unanimous that such an important industry should not be allowed to fall by the way. The greatest steel industry in the world should not revert to a part or entire dependence on foreign manganese. In 1913 over half the consumption was British alloy and there was but one American producer. There seems but one remedy for such a possibility—a tariff high enough to meet foreign competition. Such a measure is as necessary as it is to the new dye industry. It has been advocated by prominent interests in the trade, even by some of those who have been sellers of British ferromanganese in the past. Unless some such protection is afforded, it is claimed the British alloy can undersell the American. Almost any reasonable tariff on this alloy would not be a hardship, for the amount consumed per ton of steel is small; but after all, the determinations of the Peace Conference may serve to settle conditions of international trade.

There have been suggestions also of a tariff on manganese ore. Opinion is divided as to whether this is advisable. Supplies of highest grade ore are ample in Brazil. The cost of production from such ore is low. As compared with most American ores, this is an important consideration, for it is estimated that when using the best ore a blast furnace can produce only 35 per cent as much ferromanganese as pig iron. Under the stress of war conditions only about 50 per cent of the manganese ore needed came from American mines, and these were scattered and operated only under the stimulus of high ore prices. Even many of these ores had to be mixed with better foreign ores.

Mention should be made also of the export possibilities. England for many years has been the source of such alloys for Canadian and European consumers, as well as American. It is not improbable that the American industry, aided by a new merchant marine and perhaps protected by a tariff, might be an important factor in this phase of export trade. Ferromanganese is an excellent commodity as ballast, and this fact was taken advantage of by England before the war when she sold her standard alloy as low as $38, seaboard. In 1913 the British exports were about 179,000 tons, of which over 120,000 tons came to the United States. In 1918 the total had fallen to 66,000 tons, with only 27,000 sent to American consumers. At present the foreign alloy cannot be imported, the war measure being still in force. In the mean time the future of this new American industry faces extreme uncertainty.

Labor Is Speeding Up

Reports of a most encouraging nature are coming from manufacturers in the Central West in respect to the restoration of greater efficiency in labor. During the period of the war, efficiency reached a low ebb. A workman knew that if he were discharged or voluntarily left one job, another was waiting for him. Consequently incentive to effort was lacking. With the scarcity of labor, few men were turned away from the factory employment office and men largely incompetent were put to work. These two factors, lack of incentive on the part of skilled men to do a fair day's work, because of having no fear of dismissal, and the placing of unskilled and incompetent men in the shops, resulted in a marked decrease in general efficiency and a corresponding increase in the cost of production.

Now conditions are greatly changed. Men capable of doing a good day's work are coming to realize that they must render the service for which they are paid; knowing that there are plenty of others waiting to take their place and that a new job is no longer easy to find. In addition, a weeding out process is being carried out, and men who are still laboring under the delusion that they can give minimum effort in return for their wages, as well as those who are not fitted for the work, are being replaced at the same wages by more competent men. In this way, plants are again being keyed to an efficiency basis, and there is a decided increase in output with the same number of men on the payroll, or, in other words, a decrease in labor costs without a lowering in wages.

Work for Soldiers

If the better labor performance referred to in the foregoing editorial is coming soon to be true of the country as a whole, as seems likely, the way is being made for the dismissal of the I. W. W. or Bolshevik type or whatever else one may wish to call the radical disturbing element. Getting the undesirable out clears the path for receiving the returning soldier.

An analysis of recent labor demands will show that most of them, particularly those of sweeping character, emanate from alien workmen. It is they as a class who mistake liberty for license and who have been giving most concern as likely to incite to riot. It is also they who are the poor performers and the time has now arrived to show them that the country is not large enough to nurture indefinitely those who refuse to accept opportunities to learn of our institutions or who strive to do as little as possible for a given unit of wages. They have a loud bark, but even if broad strikes are called as it becomes necessary to lay off large numbers of the noise-makers to provide places for capable and certainly deserving soldiers, the great mass of thinking wage earners will hardly long stay stampeded. By putting Americans at work as against those unnaturalized, other things being equal, a part of the demobilization problem is solved and a positive step will be taken in the desired spread of Americanization and thus the rooting out of the cancerous growth which has had too full a sway among the unassimilated foreigners. The present unrest is partly the paying for the general disregard of the alien workman, who has been allowed to steer his own course unchartered.

In the establishment of the Government price conference body, rapidly taking form at this writing, there is the anomalous situation of the Government's being interested as though a buyer in

effecting horizontal reductions in certain commodity prices while it is actually a seller on a large scale of quantities of material no longer needed, now that hostilities have ceased. There is a praiseworthy motive behind the movement in that it is aimed at reviving business, largely, however, to reduce unemployment. So far as disposal of its war purpose purchases are concerned, the Government gives as yet no evidence of careless dumping but instead seeking of buyers through usual channels and in normal ways. If definite price adjustments proclaimed under Government auspices should develop business, then not Government buying but Government selling will be the noticeable thing.

The Great Lorraine Deposits

A confidential German document which has been published by the Comite des Forges de France covers familiar ground to a large extent as it relates well-known facts in regard to the iron deposits of Lorraine, but it emphasizes the determination of the Germans to take possession of the mines which they considered imperatively necessary in order to insure the future prosperity of the iron and steel industry of Germany.

After pointing out that for many years Germany had been obliged to depend on other countries for a large part of its supply of ore, and discussing treaties as if they amounted to nothing, the document, which evidently was written at a time when Germany felt confident of victory, remarks that "our mining base enlarged by the addition of Briey and Longwy would insure for a century the future of our iron industry, and would hence insure also our retention of the place which, with the help of the iron ore of Lorraine, we have conquered during the last ten years among the iron-making countries of the world, at the cost of hard struggles with Great Britain."

The document also points out that the greater the iron and steel making resources of a country the more it is dreaded as an adversary. The document then adds:

> The displacement of our Lorraine frontier is absolutely indispensable for the safety of the German Empire in the case of a future war, but it is equally necessary for the consolidation of our political economy, and especially in order to supply employment to our large number of workmen, to increase the production of our soil, and hence to improve the situation of each individual German.
>
> All of Lorraine in the hands of Germany would constitute not only a war indemnity and a support for the German fatherland, but also a guarantee of a lasting peace and a gage for the security of the empire. Our victory gives us the occasion and the right to add to the most vulnerable point of attack on the German Empire a sharp rock against which every enemy assault will be broken.
>
> If this opportunity be neglected, the German people will in a future war be doomed to ruin.

A perusal of this document will convince one, if any evidence were needed, of the bitterness of the feeling that Germany must have, in seeing the valuable mines fall into the possession of the French. If, however, the Germans will content themselves by following the pursuits of peace, it is not at all improbable that they will be permitted to buy and use as much of the ore as they need; in fact, although the Alsace-Lorraine district will become a part of the French Republic, the mines, the blast furnaces and the steel plants are to a large extent owned by Germans. The French Government will, of course, dictate the National policy as to whether the ore shall be sold to other countries or not, but it is not at all likely that the exporting of the ore to a reasonable extent and of iron and steel products will be prohibited.

Steel Production Statistics

Owing to the setback given routine work by the war, the American Iron and Steel Institute has only within the past week completed the compilation of steel production statistics for the year 1917, and the figures are given fully elsewhere in this issue. Steel production in 1917 included 43,619,200 gross tons of ingots and 1,441,407 tons of castings, making a total of 45,060,607 tons. There is not much news in the ingot figure, as an intimation given in the monthly report four months ago enabled THE IRON AGE to state in the issue of Oct. 17, 1918, that the ingot production in 1917 was approximately 43,700,000 tons, and in THE IRON AGE of Jan. 2, 1919, it was estimated that the production of ingots and castings was 45,000,000 tons, but no detailed estimate was attempted.

The recorded production of ingots in 1917 gives further confirmation of the estimate of 49,000,000 tons as the present capacity, given in this department under date of Jan. 16. There was new construction completed in 1917 of 4,326,000 tons and in 1918 of 1,945,000 tons. Assuming that the new capacity came in at uniform intervals during 1917, one-half of it contributed to the 1917 output; and making the conservative estimate that actual commercial capacity is 85 per cent of the rated capacity, the additional capacity to be figured is 3,500,000 tons, which, added to the 1917 production, would give 47,100,000 tons as the capacity at the beginning of this year provided 1917 output equalled the capacity. This it has been well known right along was not the case, and the curtailment in 1918 was still greater. The 49,000,000 ton estimate of capacity is based upon 1916 production, when capacity operations actually were achieved.

It was a very interesting circumstance that the production of steel ingots and castings in 1916, 42,773,680 tons, was 10,600,000 tons in excess of the best production in any preceding year, the increase being the largest ever recorded in point of tonnage and one of the largest in point of percentage. There had, moreover, been three years that stood about the same, 1912 and 1913, with a trifle over 31,000,000 tons production, and 1915, with a trifle over 32,000,000 tons. Since 1916 recorded the jump to 42,773,680 tons, there have been two additional years of somewhat the same size, 1917 with 45,060,607 tons and 1918 with about 41,800,000 tons. The three years make an average of 43,200,000 tons.

The production of rolled steel is always, of course, in fairly close relation to the production of ingots, but for 1917 there was an interesting divergence. In 1912, 1913 and 1914 the proportion of rolled steel to steel ingots was uniformly 76 per cent. In 1915 and 1916, the proportion was 74

per cent and in 1917 the proportion dropped to 71.7 per cent. The successive drops were due to shell steel manufacture, not because many shells were forged, since the rolled steel statistics include rolled forging blooms and billets as well as unfinished steel for export, but because there were such heavy discards from the ingot in the case of shell steel. In 1918 the War Industries Board made great efforts to find employment for shell steel discards so that they would not need to be remelted, and the extent by which these efforts were successful will be suggested in the 1918 statistics and, specifically, in the amount by which the proportion of rolled steel to steel ingots in 1918 exceeded 72 per cent.

The production of steel castings made a new high record in 1917, with 1,441,407 gross tons. The steel casting, however, has not developed in tonnage altogether to the extent predicted by its friends some 10 or 15 years ago. The 1917 production, for instance, fell a few per cent short of doubling the 1906 output, and actually fell a few per cent short of showing as large a proportionate increase as did the output of steel ingots. For a young industry the showing in steel castings is not remarkably good, particularly as the iron foundry industry has an output of many millions of tons a year, and it was expected that there would be quite a pronounced displacement of iron castings by steel castings.

There was a remarkable similarity in the distribution of steel in its various finished forms in 1916 and 1917. The total production of rolled iron and steel was 32,380,389 gross tons in 1916 and 33,067,700 tons in 1917, showing an increase of 687,311 tons, but the great majority of items showed substantially the same tonnage for each year. Blooms, billets, sheet bars, etc., for export increased about 600,000 tons while wire rods decreased about 400,000 tons. Plate output increased nearly 500,000 tons, and there was an increase of a trifle over 200,000 tons in black plates for tinning. These were the only changes of any importance.

The changes in plate production were quite significant of the heavy demand for steel for shipbuilding when at the same time the demand for steel for building purposes generally underwent a slight decrease. The production of universal mill plates, not used to any great extent in shipbuilding, decreased 29,035 tons, while the output of sheared plates under ¼ in. thick decreased by 86,407 tons. The production of sheared plates ¼ in. and heavier, on the other hand, increased by 596,296 tons, to 2,461,938 tons. There was little new plate capacity to contribute to the 1917 output, but much new capacity came in last year, and the existing capacity is far in excess of the output just recorded for 1917.

The Brightman Mfg. Co., South Columbus, Ohio, manufacturer of turned shafting and superior cold-finished nuts, announces that it has appointed the Superior Sales Co., Charles A. Ingle, president, Rochester, N. Y., to handle its line in the Buffalo territory. The company was formerly represented by the Mayer & Clarkson Co.

The Wm. B. Pollock Co., Youngstown, Ohio, has issued Circular No. 30, giving a series of photographic brochures of No. 5 blast furnace, which it built complete for the Republic Iron & Steel Co., at Youngstown, Ohio.

CONTENTS

Will Hold Joint Conventions

The American Supply and Machinery Manufacturers' Association will hold a joint convention with the Southern Supply and Machinery Dealers' Association in New Orleans April 7, 8 and 9. In addition it will also hold a joint convention with the National Supply and Machinery Dealers' Association in Pittsburgh, May 14, 15 and 16. Headquarters will be at the William Penn Hotel. This convention follows that of the National Pipe and Supplies Association held in Pittsburgh on Monday and Tuesday of the same week.

National Safety Council

Cleveland has been selected as the place for the holding of the eighth annual congress of the National Safety Council. It will be held during the week of Sept. 29. Arrangements are in charge of the North Eastern Ohio Safety Council, of which S. W. Tener, of the American Steel & Wire Co., Alexander C. Brown, president Brown Hoisting Machinery Co., and C. E. Pettibone, safety director of Pickands, Mather & Co., are vice-presidents.

COLONEL BOLLING'S DEATH

Statement of Captured Chauffeur Tells of Fight with German Officers

Additional facts in regard to the death in service of Colonel Raynal C. Bolling, former general solicitor of the United States Steel Corporation, have been sent to Mrs. Bolling by Captain E. P. Merrill, who obtained a deposition from Colonel Bolling's chauffeur, recently released from a German prison camp.

Colonel Bolling was killed near Amiens on March 26 of last year in the first of the great German drives, but no information concerning the manner in which he met his death had been received previously.

The chauffeur was Paul L. Holder of the 22d Aero Squadron. He was assigned to drive the car for Colonel Bolling, after the latter had been assigned by General Pershing to observation duty for a short period with the Royal British Flying Corps. He was driving in his machine toward the front in the face of the German fire, when he was trapped and killed. The following is a summary of the chauffeur's account:

"About 26 kilometers east of Amiens Colonel Bolling met several British officers and inquired of them whether the Germans had arrived near that point. They told him they had seen no Germans near, their latest information was that the enemy's line was still three miles to the east, whereupon the colonel directed Holder to proceed. The car began the ascent of a considerable hill near Estrees, from which the old battlefield of the Somme could be clearly seen, but before the summit was reached, concealed enemy machine guns suddenly opened fire upon it from both sides of the road. The chauffeur attempted to turn his car, racing his engine to avoid stalling it, but the hail of machine gun bullets punctured the radiator and Colonel Bolling ordered him to jump and take to cover.

"Holder found a shell hole by the road that gave protection and lay in it with his face turned, watching Colonel Bolling as the latter, in a depression near by, very coolly loaded his pistol, while machine gun bullets sang about them.

"Soon firing ceased, a German officer appeared on the rim of the shell hole occupied by Holder, who was unarmed, and began shooting at him, the pistol bullets striking around the chauffeur's head, but missing him. Colonel Bolling, who was an expert with the revolver, shot at the German and killed him instantly. Immediately a second German officer appeared and fired twice at Colonel Bolling. The first shot went through his heart.

"Holder pretended that he was dead, hoping that when dark came he might make his way west through the new German line forming. He was not disturbed for more than an hour, although German soldiers were constantly passing. Finally they discovered he was alive and marched him back to a prison camp. He saw them rip open Colonel Bolling's traveling bag and rifle his pockets."

Affidavits of Holder in regard to his death were originally filed in the Paris war office, and last week were confirmed by the War Department at Washington. Colonel Bolling was the first American officer of that rank to give his life in the war. His work of organizing aero units had been so successful that he was placed in the front rank of Americans in France by such men as Lord Northcliffe, Lord Rothmore and Carl B. Cravath.

Problems of American Industrial Readjustment

Maximum efficiency in production, closer co-operation between management and labor, reduction in the cost of living, continued saving, and a clearer definition of the Government's relation to industry, are the points given major emphasis in a report issued by the National Industrial Conference Board, 15 Beacon Street, Boston, on "Problems of Industrial Readjustment in the United States."

One of the most immediate problems of readjustment according to the report is that presented by the prevailing scale of wages. So long as wages remain at the current level a downward revision of living costs is exceedingly difficult. An increase in the efficiency of individual production to such a degree that employers will be warranted in paying relatively high wages is regarded as the most promising solution of the present wages problem. "This," says the report, "seems to be the only means of escaping the vicious circle by which an increase in the cost of living is used as a reason for demanding higher wages which, in turn, are important factors in high prices of goods, resulting in still another rise in the cost of commodities consumed by the worker.

A sharp, though possibly short, period of unemployment is indicated in the report. Although it is considered that the demobilization of the military forces now overseas—approximately 1,800,000—is likely to extend over such a period of time as not to seriously complicate the immediate situation, the rapid demobilization of the 1,700,000 men who were in military camps at the signing of the armistice and the necessity of providing work for a still larger number of civilian war workers throw a heavy strain on industry, especially in view of the present high scale of wages. This is likely to be felt most seriously in the iron and steel, textile, and other major branches of industry employing common labor on a large scale. Here the report calls attention to the fact that a marked slackening in activity has already taken place, frequently resulting in short time and more or less unemployment.

The report takes a generally optimistic attitude toward the outlook for foreign trade. It points out that other great wars have almost universally been followed not only by an early resumption of trade relations between the belligerents, but by an increase in their trade exchanges. Thus, whereas French imports from Germany in 1869 were $50,000,000 in 1872, the year after the close of the Franco-Prussian war, they were almost $70,000,000. German imports from France, in turn, rose from $60,000,000 in 1869 to an average of about $83,000,000 in the five years following that war. A similar expansion in trade between the United States and Spain occurred soon after the Spanish-American war, and between Russia and Japan following the Russo-Japanese war. "These facts suggest," says the report, "that despite the strong feeling engendered by the war, the nations engaged—all of whom are keenly awake to the importance of foreign trade—will resume commercial relations without any extended period of interruption."

Canadian Electric Steel Plant for Sale

The plant of the British Forgings, Ltd., West Toronto, Ont., is offered for sale by the Imperial Munitions Board of Canada. It is an electric steel plant containing 10 six-ton Heroult electric furnaces. It was described in THE IRON AGE, April 25, 1918, and was operated almost solely on making shell steel during the war. It is understood that one of its special advantages is the low cost of its electric power, not far from 3 mills per kilowatt-hour.

THE IRON AGE is officially advised that the Sharon Steel Hoop Co., Sharon, Pa., does not purpose to erect by-product coke ovens, or make any other important extensions to its Sharon plants at this time. The company is making some important additions to its Haselton, Ohio, plants, which will be completed in April, and will very much increase the capacity of the works at that place.

H. Boker & Co., Inc., has opened an office at 447 Book Building, Detroit, for the handling of its line of tool steel and steel specialties. This office is in charge of W. H. Raisbeck, who expects to open a new warehouse in a short time.

La Belle Iron Works, Steubenville, Ohio, expects to resume the manufacture of galvanized sheets in the near future. It discontinued the making of sheets in this finish nearly three and one-half years ago on account of the spelter situation caused by the war.

Neville Island Project Is Abandoned

Method of Salvage Not Yet Worked Out—Liquidation Commission Appointed —Contract Validation Bill Still Pending

WASHINGTON, Feb. 18.—The War Department has officially abandoned the $50,000,000 Neville Island project. For some time it has seemed probable that the department would take this action. All progress on the work stopped more than a month ago. But the actual cancellation of contracts and the official abandonment of the entire project was not decided upon until last week.

The whole program was so large that it included a long list of heavy contracts. It took considerable time to get at the exact details of this. Through the Ordnance Department, the War Department ordered a special investigation of the exact status of the matter, including the point to which the various contracts had been completed and the amount of work still to be done. It had been the intention of the War Department officials to drop the project, but they wanted to find out first whether it would be more profitable to bring it nearer to completion before an attempt should be made to dispose of it.

After an exhaustive investigation, however, the department concluded that the project should be abandoned in its entirety. The question of salvage has not yet been worked out. It seems likely, however, that the United States Steel Corporation, which undertook to build the plant for the Government, will have the first opportunity to repurchase it.

The Neville Island plant was one of the largest undertakings of this kind which was worked out by the War Department during the war. It was intended chiefly for the production of the largest caliber of heavy artillery. No gun of less than 14 in. was to have been built there. The difficulty, however, lay in the fact that the project was so large that it could not be completed until some time this year. Even before the signing of the armistice, congress had declined to make appropriations for its further extension. The existing appropriation of $40,000,000, however, had not yet been expended and the refusal of congress had made no difference in the progress of the plant. The full amount which congress was asked to appropriate was $140,000,000.

General Readjustment

The War Department is making slow progress on the general readjustment of canceled contracts. Most of the contractors have apparently been waiting until congress should clear up the tangle over the contract validation bill, hoping that it would give them more liberal relief than the strict terms of their contracts would allow them. The last few days, however, have shown that congress is inclined to be even less liberal than the department, and the claims for adjustment are coming in more rapidly. The contracts which were not executed in strict compliance with the law must still wait until congress has acted.

To take care of the contract adjustment involving claims of the War Department in favor of or against the British and French governments, "The United States Liquidation Commission of the War Department" has been appointed with the express approval of the President. This commission will have its headquarters in Paris and will have the general adjustment of claims growing out of arrangements abroad and in this country for the furnishing of supplies and munitions, the disposition of all properties in France and England used by the American forces, and the general liquidation of the business and financial affairs of our armies in France and England. Claims against the French and British governments growing out of arrangements and contracts made in the United States with the War Department will be developed by the Supply Service officials as heretofore, and will then be turned over to the new commission for final adjustment and disposition. The members of the commission are: Chairman Edwin B. Parker of Houston, Tex.; Senator Henry F. Hollis of New Hampshire, Homer H. Johnson of Cleveland, and Brig. Gen. Charles G. Dawes of Chicago. A fifth member may be appointed later.

Machine Tool Problem

The office of the Director of Sales is still wrestling with the machine tool problem. The long promised inventories have not been completed, and Col. A. LaMar, who is in charge of this branch, has gone to Chicago and Cleveland to study the problem at first hand. The department is pushing a bill pending in congress which would make it possible to use surplus machine tools in the colleges. The bill provides:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War shall lend to trade and technical schools and universities and other recognized educational institutions which in the discretion of the Secretary of War should have such equipment the machine tools suitable for their use which are owned by the United States of America, which are under the control of the War Department, and which are not being used for Government purposes;

Provided, however, that each institution so equipped shall be responsible to the United States of America, under regulations to be prescribed by the Secretary of War, for the proper care and safe return of such equipment when demanded, ordinary wear and tear excepted.

Automobile Surplus

The surplus automobile situation is in better shape, both as to passenger automobiles and motor trucks. The Motor Transport Corps estimates that after the needs of the reorganized army have been cared for, there will be a surplus of less than 5 per cent of cars and that these will be turned over to the Post Office Department under the existing law. Only such vehicles as are not suitable to post office service will thus remain for public disposition. The corps also plans to have the post office use War Department standard cars in the future, and thus provide the nucleus for the war needs of the army.

Although it has not made public, the details of the completed inventories, the office of the Director of Sales has announced that the final listing of property in the Construction Division shows a total, in the cost to the Government, of $12,000,000 worth of materials.

Besides this there is about $3,500,000 worth of construction equipment, office furniture and small tools. Approximately $2,000,000 worth of construction material has already been absorbed by transfer to other War Department bureaus.

Contract Validation Bill

The House of Representatives has refused to add a clause to the contract validation bill which would authorize the Secretary of the Interior to pay producers of rare minerals for the losses sustained because the cessation of hostilities ended the need for domestic production. By a vote of 214 to 117 it ordered its conferees to refuse to accept the Senate proposals on this subject "in any form."

This fight again delayed the final consideration of the long debated relief measure. It has now been twice held up in conference, tying up billions of dollars worth of contracts and claims.

The conferees of both houses are now expected to drop the "rare minerals" amendment entirely and to limit the legislation to the validation and adjustment of war contracts that were technically incomplete. The conferees had already dropped all proposals for commissions and appeal boards. The adjustments are now to be entirely in the hands of the War Department with no appeal, except to the Court of Claims.

Iron and Steel Markets

PRICES SLOWLY MELTING

But of No Importance and No Change in Volume of Business

American Negotiation for Luxemburg Plants—French Steel Companies Combine for Selling

Business has been maintained at the rate of recent weeks. It is almost wholly for necessities, though the response to the public agitation for municipal improvement work has assumed some proportions. The situation is better than a month ago in that there will be thirty days less to wait for revived buying.

By the end of the week the machinery of the Government price investigating board, which is to start with the steel trade, will be under motion. Doubts are expressed that proclamations naming what are officially regarded as fair prices will be convincing. The Government sitting in as a buyer is for the moment actually a would-be seller of all the war material and supplies no longer needed, and the investment project will wait for a paring of war wage rates as well as of war commodity prices.

Some time will likely be consumed in arriving at the new proposed stabilizing prices, and meanwhile the business world may have passed far enough along the road of convalescence from war shock to get active on its own account without Government intervention. What the trade regards as of far more importance is settlement of the railroad question and the many unpaid war contracts.

Downward marking of prices is proceeding in a natural way, but in general it is confined to quotations and not to actual transactions. On 4850 tons of plates for battleships one bid was $1 per ton below present accepted levels and on 700 tons of flange steel the usual extra of $3 was waived. Lower prices have been named on alloy steel and a general reduction of $4 per ton is expected this week in rivets. Wire nails have been quoted at 15c. a keg lower than prevailing rates, and cutting has been done in coated nails. Some silvery pig irons have been given the $3 cut made in December for irons in general. Resale material accounts for most of the other price concessions reported.

Export inquiry is in good volume, but high ocean freight charges are still a deterrent. For China 3000 tons of low-phosphorus copper-bearing pig iron has been sold. England lost a tin plate order to the United States, which named $18.55, c.i.f. Lisbon. This, seeing that the Pittsburgh price is $7.35 per box, shows how much the buyer has to pay beyond the mill price. Seaboard prices for export are now about domestic prices.

A central selling organization has been established for French makers of rolled steel products. It is a sign that the amount of American finished material exported to that country will be easily measured.

American entry into European trade is marked in another way. A group of the steel trade is reported negotiating for the Differdingen mines and works in Luxemburg.

The rehabilitation of the French collieries will cost, it is now estimated, $400,000,000, but part of it will necessarily be spread over ten years.

An exaggerated case of the low state of business activity is the rate of contracting in the fabricated steel industry in January. Then 21,600 tons of work was booked. In the depression following the outbreak of war the lowest monthly figure was 34,500 tons for November, 1914.

Cast-iron pipe continues a marker of public buying. Detroit has closed for 6000 tons and will take bids this week on 4000 tons more. For the Emergency Fleet Corporation 20 drydocks for the Atlantic Coast are under consideration.

The surplus of the War Department's motor trucks is put at 5 per cent, and these are to go to the Post Office Department.

Wire mills are receiving orders at the rate of only 30 per cent of capacity but specifications on old contracts amount to 30 or 40 per cent.

Pittsburgh

PITTSBURGH, Feb. 18—(*By Wire*).

The situation seems to be getting quieter and the amount of buying in nearly everything lessening. Reports are current of serious cutting in prices, but when these are run down they generally turn out either to be untrue or else the cutting, if it is being done, is either by jobbers, or by consumers offering material for resale. Several small lots of basic and foundry iron have been resold in this market recently at prices $1 to $2 per ton under what are regarded as the regular market. The fact is, however, that not enough business is being offered in any line, either in pig iron or finished steel products, to test prices, and the further fact is recognized that to offer consumers concessions in prices would probably not bring the business, but would simply add to the uncertainty of the buyer and cause him to hold off. The situation is that neither jobbers nor consumers are in a buying mood and concessions in prices would not stimulate business to any extent.

There is a strong impression here that in the late spring the large steel companies will probably make a further reduction in prices on steel and one that will be large enough in their opinion to cause buyers to come in the market. However, this will not be done until good weather comes. Then plants with high costs—and these include blast furnaces, steel works and finishing mills—may have to close down, and turn loose on the market a large amount of unemployed labor. These men will be able, to some extent at least, to find outdoor employment, and not remain idle.

The whole steel market has been on an artificial basis for two or three months. That is, prices are entirely artificial, and are being maintained not because of a demand, but simply by an understanding among producers. How long this can last is a question, but at present there are no signs of a general break in the

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 18, 1919	Feb. 11, 1919	Jan. 21, 1919	Feb. 20, 1918
No. 2 N. Philadelphia ‡	$36.15	$36.15	$36.15	$34.25
No. 2, Valley furnace†	31.00	31.00	31.00	33.00
No. 2, Southern Cin'ti†	34.60	34.60	34.60	35.90
No. 2, Birmingham, Ala.†	31.00	31.00	31.00	33.00
No. 2, furnace, Chicago*	31.00	31.00	31.00	33.00
Basic, del'd, eastern Pa	33.90	33.90	33.90	33.75
Basic, Valley furnace	30.00	30.00	30.00	33.00
Bessemer, Pittsburgh	33.60	33.60	33.60	37.25
Malleable, Chicago*	31.50	31.50	31.50	33.50
Malleable, Valley	31.50	31.50	31.50	33.50
Gray forge, Pittsburgh	31.40	31.40	31.40	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$55.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	57.00
Bess. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. sheet bars, P'gh	47.00	47.00	47.00	51.00
Forging billets, base, P'gh.	56.00	56.00	56.00	60.00
O.-h. billets, Philadelphia	47.50	47.50	47.30	50.50
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	3.145	3.145	3.745	3.685
Common bars, Pittsburgh	2.99	3.50	3.50	3.50
Iron bars, Chicago	2.92	2.97	3.17	3.50
Steel bars, Pittsburgh	2.70	2.70	2.70	2.90
Steel bars, New York	2.97	2.97	2.97	3.095
Tank plates, Pittsburgh	3.00	3.00	3.00	3.25
Tank plates, New York	3.27	3.27	3.27	3.445
Beams, etc., Pittsburgh	2.80	2.80	2.80	3.00
Beams, etc., New York	3.07	3.07	3.07	3.195
Skelp, grooved steel, P'gh.	2.70	2.70	2.70	2.90
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	3.25
Steel hoops, Pittsburgh	3.30	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Feb. 18, 1919 Cents	Feb. 11, 1919 Cents	Jan. 21, 1919 Cents	Feb. 20, 1918 Cents
Sheets, black, No. 28, P'gh.	4.70	4.70	4.70	5.00
Sheets, galv., No 28, P'gh.	6.05	6.05	6.05	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh	5.00	5.00	5.00	4.00
Fence wire, base, P'gh.	3.25	3.25	3.25	3.25
Barb wire, galv., P'gh.	4.35	4.35	4.35	4.35
Old Material, Per Gross Ton:				
Carwhee's, Chicago	*$22.00*	$23.00	$26.00	$30.00
Carwheels, Philadelphia	23.00	23.00	25.00	30.00
Heavy steel scrap, P'gh.	15.00	15.00	17.00	30.00
Heavy steel scrap, Phila.	*14.00*	15.00	16.00	30.00
Heavy steel scrap, Ch'go.	*14.50*	15.00	16.50	29.00
No. 1 cast, Pittsburgh	19.00	19.00	23.00	30.00
No. 1 cast, Philadelphia	23.00	23.00	24.00	30.00
No. 1 cast, Ch'go (net ton)	19.50	19.50	21.00	25.50
No. 1 RR. wrot, Phila.	*20.00*	23.00	24.00	35.00
No. 1 RR. wrot, Ch'go (net)	*14.50*	15.00	16.00	31.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.25	$4.25	$5.25	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	5.00	5.00	5.25	7.00
Foundry coke, future	7.00	7.00	7.00	7.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*17.50*	18.50	20.00	23.50
Electrolytic copper, N. Y.	*17.00*	18.00	20.00	23.50
Spelter, St. Louis	*6.35*	6.50	6.75	7.75
Spelter, New York	*6.70*	6.85	7.10	8.00
Lead, St. Louis	4.70	4.70	5.25	6.85
Lead, New York	5.00	5.00	5.50	7.00
Tin, New York	72.50	72.50	71.50	85.00
Antimony (Asiatic), N. Y.	7.12½	7.12½	7.50	13.50
Tin plate, 100-lb. box, P'gh.	$7.35	$7.35	$7.35	$7.75

market, in spite of the fact that new buying is at a very low ebb and has been for three months.

The problem of labor is the most serious one that confronts the producers to-day, and there is no intention of making a horizontal cut in wages while present high costs of living are in effect. Manufacturers are taking a broad view of the labor situation and are being guided by their actions in regard to operating or shutting down by the best interests of labor. They realize fully that to make heavy cuts in wages would be unfair to employees and they are doing all they can to avoid this action. However, it is recognized that if another horizontal cut is made in steel prices labor must bear its part of the burden and work for less money. Prices paid for labor in the future will be regulated as in the past by the old law of supply and demand.

Demand for pig iron and semi-finished steel is still limited, but on some of the lighter lines of finished steel it is reported better than a month or six weeks ago. Sheets and tin plate are fairly active, new demand for oil country goods and lap-weld pipe is also active, but a part of the output of the pipe mills at present is going into stock. Prices on coke seem to have settled down to about $4.25 to $5 per ton, and it is not believed will go any lower, as there has been a heavy reduction in output.

The scrap market is still neglected with prices very weak, nearly all sales being of material that has to be moved and always goes at low prices.

Pig Iron.—Today (Tuesday) a meeting of the Associated Manufacturers of Merchant Pig Iron was held in the William Penn Hotel in this city. C. D. Dyer, Shenango Furnace Co., presided in the absence of H. G. Dalton, Cleveland, who was unable to come on account of illness. There was a full discussion of present conditions in the pig iron trade, and the consensus of opinion seemed to be that lower prices on pig iron would likely come in the near future, and probably some furnaces with high costs would have to go out, as they will be unable to meet the market. It is known that a number of merchant stacks are being operated only to use up their last year ore, and when this is done they will go out of blast until conditions in the pig iron market improve. In regard to stocks, reports made at the meeting show that these are subnormal and not nearly so heavy as generally believed in the trade. Furnaces realize that it is not a good time to pile iron at present high costs. The American Pig Iron Association also met in the afternoon, but no important action was taken aside from the election of D. T. Croxton, president, Cleveland Furnace Co., as vice-president of the Cleveland section. There is no new demand for pig iron, only an occasional small lot of Bessemer, basic or foundry iron being sold for prompt shipment. We note a sale of 250 tons of standard Bessemer iron at the regular price of $32.20 at Valley furnace. Furnace operators say they are not cutting prices in an effort to secure new business, as they know it would be useless to do so. It is said there is very little resale iron on the market, but recently two or three small lots of basic were sold here by a consumer at slightly under regular market prices, which are as follows:

Basic pig iron, $30; Bessemer, $32.20; gray forge, $30; No. 2 foundry, $31; No. 3 foundry, $30.50; and malleable, $31.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Sheets.—The automobile trade is doing most of the buying in sheets, the demand from general consumers being only fair. The export inquiry for electrical sheets and also for other grades is heavy, and sales of considerable size have been made. Reports are that prices on sheets are being shaded more or less in certain districts, but as yet this has not become serious. The American Sheet & Tin Plate Co. is operating

to about 75 per cent of its hot sheet mill capacity, running 15 turns per week, thus allowing their men Saturday and Sunday for rest after the strenuous operation of sheet mills for the past several years. Independent mills are operating at 60 to 70 per cent, also on 15 turns per week. Prices on sheets, which the mills state are being held by them but which are being shaded in certain sections by jobbers, are given in detail on page 522.

Ferroalloys.—Stocks held by consumers are very heavy, and some material is being offered for re-sale. There is no demand and consumers are covered ahead for months, some for practically all this year. It is stated that 70 per cent ferromanganese has been offered for resale as low as $150 per gross ton, delivered, but this is not confirmed. There have been no new sales in this market of moment for some time.

We quote 70 per cent ferromanganese at $190 to $200, delivered, and 16 to 18 per cent spiegeleisen, $60, f.o.b. furnace, an addition or deduction of $3.50 per unit being made, when the manganese content is above or below the standard. Fifty per cent ferrosilicon is quoted at $125.

We quote 9 per cent Bessemer ferrosilicon at $52; 10 per cent, $54; 11 per cent, $57.30; 12 per cent, $60.60. We quote 6 per cent silvery iron, $39; 7 per cent, $40; 8 per cent, $42.50; 9 per cent, $44.50; 10 per cent, $47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2.90 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—There is no demand for billets or sheet bars, and in some cases consumers are asking the mills to hold up shipments, as they are not running to over 50 per cent and are accumulating too much steel. The opportunity is being taken during the present quiet demand to make needed repairs at the different steel plants, and the blooming mill at the Sharon, Pa., works of the Carnegie Steel Co. has been closed for 10 days or two weeks to make needed repairs. It is said that some steel is being offered for resale at prices under the regular market but without finding buyers. Prices on billets and sheet bars are purely nominal as no steel is being sold on new orders, these prices being as follows:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $43.50, sheet bars $47, slabs $46, and forging billets $56 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—The local market is absolutely neglected, and no new jobs are in sight in this district. It is said some of the fabricating plants are down to a 30 to 40 per cent operation and have very little work ahead. Hopes of the fabricators are centered on the program of the Railroad Administration, which, if it goes through, will mean a good deal of new business for the fabricating shops. Railroads are placing only very small orders for repair work.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Plates.—The market is very quiet, buyers placing orders only for small lots to cover actual needs and for prompt shipment. Some mills have so little work on their books that they can promise delivery in a week or 10 days from date of order, while others of the larger plate mills have a fair amount of work ahead for several months. There is a good deal of export inquiry for plates, and it is believed the lower ocean freights will soon stimulate export business to a considerable extent. Reports are that some of the smaller mills are willing to shade prices slightly to secure business. We continue to quote ¼ in. and heavier sheared plates at 3c. at mill.

Iron and Steel Bars.—Very little business is coming out either in iron or steel bars, and some mills are getting very short of work. Specifications against contracts and steel bars from the implement makers are reported as coming in at a fair rate, but as a rule bar mills are not being operated to more than 50 to 60 per cent of capacity. Prices on iron bars are more or less irregular, not enough new business being placed to test the market. Prices on both iron and steel bars are not uniform in all districts, especially in iron bars, and are largely nominal.

We quote soft steel bars rolled from billets at 1.70c.; from old steel rails, 2.80c.; common iron bars, 3.50c.; bar iron rolled from selected scrap, 5.25c., and refined iron bars at 5c. at mill, Pittsburgh.

Tin Plate.—Specifications on old contracts and also small new orders are being received by the mills in fairly good volume. As a rule, independent mills are operating at from 50 to 60 per cent of capacity, while the leading interest is doing much better. The opinion is strong among consumers that they will lose nothing by holding off placing contracts, as the price will certainly not be any higher, and it may be lower. However, tin plate is in a different position from almost any other finished steel product. It is certain that the usual, or even larger acreage will be planted this year in fruits and vegetables, and provision must be made to take care of the crops when they mature; in other words, canners of fruits and vegetables must be assured of a supply of containers to pack the crop when it is ripe. For this reason it is expected that a heavy demand for tin plate will start up not later than April or May. It is said there is no disposition on the part of tin plate mills to cut prices in order to secure business. We continue to quote tin plate for domestic use and for delivery the first half of this year at $7.35 per base box, Pittsburgh. Prices on terne plate are given on page 522.

Wire Rods.—The domestic inquiry for wire rods is light, and some consumers are asking the mills to hold up shipments, stating they are not operating their wire mills to more than 40 to 50 per cent of capacity. The export inquiry for rods is active, and some sales have been made recently for shipment to Canada, and also to France and South America. However, it is said a good many of the foreign inquiries for rods are simply feelers. Prices on rods are given in detail on page 522.

Wire Products.—On Wednesday, Feb. 19, bids are to be opened in Washington on the 20,000 kegs or more of wire nails inquired for by the Navy Department. The question is still being asked in the wire nail trade why the Government does not supply these nails itself out of the stocks of about 170,000 kegs which it reported some time ago it had on hand. It is not known at this writing whether the contract will be placed or not. General demand for wire and wire nails is only for small lots to meet actual needs. Jobbers are not willing to make contracts, in spite of the fact that the mills, as a rule, are guaranteeing prices against decline on any unshipped tonnages. There is some agitation to increase the differential allowed jobbers when selling to the smaller trade from 5 to 10c. per keg, but what will eventually be done in the matter is not known now. It is said present demand for wire and wire nails is only about 30 per cent of capacity, several mills reporting they are operating to about 30 per cent on new orders and 30 to 40 per cent on specifications against contracts. Some shading is being done in prices on coated nails. A recent order for 3708 kegs is reported to have been taken by an independent mill at less than the regular differential over bright nails. The profit on coated nails allows more room for shading of prices than prices on bright nails allow. Prices on wire products are given in detail on page 522.

Hot-Rolled Strip Steel.—The demand is only for small lots to meet current needs. None of the mills making hot-rolled strip steel is operating to more than 50 per cent. Specifications are still coming in on contracts placed last year.

We quote hot-rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., while for deep stamping or drawing quality steel, 50c. per 100 lb. extra is charged, all f.o.b. Pittsburgh.

Nuts and Bolts.—The demand is getting steadily less, jobbers and consumers alike buying only in small lots to meet current wants. None of the makers is running full and several are down to about a 50 per cent operation. The Institute of Manufacturers of Nuts, Bolts and Rivets will hold a meeting in their rooms in the Oliver Building, this city, on Wednesday, Feb. 19. The present situation in nut and bolt trade, and also in prices, was fully discussed. It is said that discounts are being shaded to some extent, mostly by jobbers. These discounts are given on page 522.

Rivets.—The demand is very light, and prices are being more or less shaded in certain districts. Jobbers

and consumers are buying only what rivets they need, believing there will be a lower market before long. Prices quoted below are not being firmly held.

We quote structural rivets at $4.40 and cone head structural rivets at $4.50 base, f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers report the demand only for small lots to meet current needs, jobbers and consumers still desiring to make contracts, owing to belief that prices will probably be lower later on. Mills state that raw materials and labor will have to come down before they can make lower prices on their products.

We quote cold-rolled strip steel at $6.25 base per 100 lb. for 1½-in. and wider, 0.100 in. and thicker, and commercial steels under 0.20 carbon. Boxing charge 25c. per 100 lb.

Shafting and Screw Stock.—Makers report that present demand is only for 30 to 35 per cent of capacity, and a good part of this is coming from the automobile trade. Specifications against contracts from implement makers are fair, but the screw stock machine people are buying very little. Makers claim the discounts are being firmly held.

We quote cold-rolled shafting at 21 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Spikes.—New inquiries are only for small lots for needed work, and range from a carload to 400 or 500 kegs. The demand for boat spikes is also very quiet, and none of the makers of spikes is running to more than 40 to 50 per cent of capacity. It is said prices are being held on a very small amount of new business placed.

We quote standard spikes, 9/16 x 4½ in., at $3.65, and small spikes at the same price in carload lots of 200 kegs or more at $3.65 per 100 lb., plus usual extras. We quote boat spikes at $3.60 base per 100 lb. plus usual extras in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Hoops and Bands.—Demand is dull and only for small lots. It is claimed that prices are not being firmly held, but not enough new business is being placed to test the market.

We quote steel hoops and bands at 3.30c. base, with the usual extras.

Wrought Pipe.—Reports are that the Guffey-Gillespie Co. is in the market for about 40 miles of 10-in. pipe for a Mexican proposition. A very large tonnage in line pipe for projected gas and oil lines is under negotiation, and at least part of it is to be placed in the near future. The largest inquiry in the market is for 300 miles of 8-in., which is expected to come out just as soon as the project can be financed. The general demand for oil country goods is heavy and mills are filling up for several months. Lap-weld pipe is fairly active, but demand for butt-weld pipe is very dull. Leading iron and steel pipe mills are operating from 80 to 90 per cent of capacity. It is said discounts are being firmly held, and these are given on page 522.

Boiler Tubes.—The Government recently released orders for a large number of locomotives for which the boiler tubes had been placed, giving the mills considerable work. The general demand for merchant tubes is dull. It is said discounts are being firmly held.

Coke.—The situation in the coke trade has settled down to the point where plants having high costs have shut down and are out of the market. For this reason, it is believed, the decline in prices of coke is about stopped, and the market is not expected to go lower. Prices on standard grades of furnace coke range all the way from $4.25 to $5 per net ton at oven. Output of coke has been steadily reduced each week for some time, and this has helped to stop the decline in price. For the week ending Feb. 8, the output of coke in the Upper and Lower Connellsville regions was only 225,786 tons, a decline from the previous week of nearly 40,000 tons, the lowest output in the two regions in a long time. We quote standard grades of furnace coke at $4.25 to $4.50 per ton at oven and 72-hr. foundry at about $5 per net ton at oven.

Old Material.—The local condition is absolutely unchanged, with the exception that prices are still very weak, and any sales being made are usually for scrap material that is loaded on cars and has to be moved. Prices on borings and turnings are about $1 per ton lower and heavy steel scrap the same. Most of the scrap material offered in the recent B. & O. list is said to have been bought direct by consumer.

Heavy steel melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$15.00
No. 1 cast, for steel plants (nominal)	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	20.00 to 21.00
Compressed steel	14.00 to 15.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	12.50 to 13.00
Bundled sheet stampings	12.50 to 13.00
Railroad grate bars	13.00 to 14.00
Low phosphorus melting stock	20.00 to 21.00
Low phosphorus bloom and billet ends and heavy plates	22.00 to 23.00
No. 1 busheling	15.00 to 16.00
Iron car axles	37.00 to 38.00
Locomotive axles, steel	36.00 to 37.00
Steel car axles	38.00 to 39.00
Railroad malleable	18.00 to 19.00
Machine shop turnings	8.00 to 8.50
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	18.00 to 19.00
Sheet bar crop ends (at origin)	22.00 to 23.00
Heavy steel axle turnings	12.00 to 12.50
Heavy breakable cast	20.00 to 21.00
Cast iron borings	10.00 to 11.00
No. 1 railroad wrought	25.00 to 26.00

Industrial Conditions at Youngstown

YOUNGSTOWN, OHIO, Feb. 17.—Mill operations this week are placed at 78 per cent of capacity. The Carnegie Steel Co. is operating one of its blast furnaces at New Castle, Pa., banked for lack of orders. The Youngstown Sheet & Tube Co. started No. 1 blooming mill, idle for several weeks. The plate mill at the Sharon Steel Hoop Co. is idle this week. Improved schedules are maintained by Republic Iron & Steel, Carnegie Steel and Brier Hill Steel companies.

A certain portion of output is being stocked where stocking facilities are available. Steel plants generally report, however, they are able to ship for immediate consumption the larger part of their output. Valley mills will maintain present price levels, state sales officials, until spring is well advanced.

Major corporations are unwilling to cut prices, fearing such a move would precipitate a general wage question before living costs are lowered.

There has been some recession in demand for black sheets. Automobile makers are sending encouraging inquiries for sheets and some orders are being placed. The Standard Oil Co. and its subsidiaries are taking heavy tonnages of tin plate, consuming the entire output of one maker here until April 1. Considerable spot business, in the aggregate, is being placed for sheet bars, pipe and structural forms. Buyers, it is stated, are placing against immediate needs in most cases.

British Electric Steel

So far as electric steel is concerned the output shows a substantial growth, but, of course, Great Britain is still a long way behind Germany and America in tonnage, and very much below the projected capacity of the works in the country, which has been estimated, when complete, at 150,000 tons of electric steel ingots per annum, says the London *Times* in its engineering supplement.

The Hill and Water shops of the U. S. Armory, Springfield, Mass., are scheduled for a full replacement of machine tools supplied from factories operated by the Government during the war. Probably a thousand machines are involved in this plan.

At the annual meeting of the American Association of Engineers scheduled for May 13 at Chicago, Col. Walter Dill Scott, in charge of classification of personnel, U. S. Army, is to give an address on "Fitting the Engineer to his Job."

Chicago

CHICAGO, Feb. 18—(*By Wire*).

One of the few bright spots in the iron and steel field is the go-ahead spirit shown by the water commissioners of Detroit who recently placed orders for 6000 tons of cast-iron pipe, and will take bids on 4000 tons additional Feb. 20. Here and there smaller tonnages of pipe are under inquiry and the outlook is more hopeful in this line.

In plates, shapes, bars and sheets, which make up the bulk of steel products, not much change is presented. Small orders specifying prompt delivery continue to appear, but their aggregate is not great enough to keep pace with shipments. The leading local interest is shipping twice as much as it is booking. It continues to run full, however. Consumers cling to their belief that lower prices are approaching and will not enter contracts at present levels, and the mills are not trying to induce them to do so. Railroads which have rails on order have lately shown an active interest in spikes, bolts and angle bars preparatory to spring track work, and have placed some good orders. But the Railroad Administration does not regard new rail orders with favor, and some of the roads are in a bad way.

Local steel men are perturbed over press dispatches that the Dollar steamship line will transfer its Pacific fleet to the Atlantic because of the high transcontinental freight rates. The ships will continue in the China and Japanese trade, but will sail from New York and go to the Orient via the Panama Canal. Combined railroad and ocean freight rates per 100 lb. compare as follows: Chicago to Japan via Seattle, $1.35; Pittsburgh to Japan via New York and the Canal, $1.16; Chicago to Japan via New Orleans and the Canal, $1.14. The last named would seem to be the logical route for shipments from Chicago to the Far East under prevailing conditions, but the trouble is that sailings from New Orleans to the Far East are not regular. Though the Japanese are showing more interest in steel products, the outlook in that direction for the local mills, owing to the irregularity of sailings, is not good, despite the fact that Far Eastern interests have heretofore found it advantageous to buy in Chicago.

The pig iron trade continues to mark time in regard to new business, and meanwhile is busy with readjustments on contracts. A large Southern producer is revising contracts effective on deliveries after Feb. 1, and some of the Jackson county silvery makers are applying a $3 reduction to their contracts. A large agricultural implement interest is buying several thousand tons of cast scrap. Except for firmness in No. 1 cast, the entire scrap market is weak, and further declines are evident.

Ferroalloys.—No sales of ferromanganese are reported, but offerings have been made at $175 delivered. Spiegeleisen, 16 to 18 per cent, can be had at $60, furnace. Ferrosilicon is unchanged. In the adjustment of contracts, ferromanganese has been substituted for spiegel, and there is coming to light some amounts which producers of ferroalloys are willing to accept in lieu of making deliveries. On ferromanganese $100 has been mentioned and for spiegel $40. In Bessemer ferrosilicon, cancellation has been permitted on the payment of $12.50 per ton.

We quote 70 per cent ferromanganese nominal at $175 delivered; 50 per cent ferrosilicon at $125 to $130, delivered, and 16 to 18 per cent spiegeleisen at $60 furnace.

Pig Iron—New business continues to come out only in very limited degree, most of the few sales still being confined to small lots of silvery, an occasional lot of ordinary foundry, or the high manganese foundry which a local independent steel company is making. In the meantime, sellers have plenty to do of a perplexing nature in readjusting contracts to the new price level, extending contracts or making exchanges where that can be done and thus better meet the requirements of buyers. The Woodward Iron Co. is revising its contracts on deliveries made after Feb. 1, and some of the Jackson County, Ohio, makers of silvery are readjusting their contracts to accord with the general reduction of $3 per ton. None of the makers is allowing cancellations, this having been their policy from the first. Business with the foundries is spotty. The steel foundries appear to be doing the best, then come the malleable plants and last the grey iron foundries. It is again being emphasized that melters of foundry iron can profit by utilizing low silicon iron to the maximum degree, the makers of this iron asserting that the practice not only helps the foundryman, but makes blast furnace operation more stable. While most foundrymen like their silicon high as a safety factor, it is maintained that with proper manipulation of the cupola blast satisfactory results can be obtained with low silicon iron. The point is that, by keeping the cupola blast pressure down, there is less oxidation of silicon as well as of manganese and carbon.

The following quotations are for iron delivered at consumer's yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.70 to $39.00
Lake Superior charcoal, C to AA	40.70 to 42.50
Lake Superior charcoal, No. 6	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	32.25
Northern coke foundry, No. 2 silicon, 1.70 to 2.25	31.00
Northern high-phosphorus foundry	31.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	39.00
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	37.25
Southern foundry, silicon, 1.75 to 2.25	36.00
Malleable, not over 2.25 silicon	31.50
Standard Bessemer	32.20
Basic	30.00
Low phosphorus (copper free)	52.50
Silvery, 7 per cent	45.80 to 47.00

Structural Material.—The situation continues unchanged so far as new business is concerned. Hand-to-mouth orders continue to come out. The Marquette Cement Mfg. Co., LaSalle, Ill., has placed 105 tons for a sacking plant and conveyor. No other lettings are announced. Heavy shapes in particular are quiet.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Cast-iron Pipe.—The water commissioners of Detroit are showing the courage of their convictions in a way pleasing to the pipe makers. All told, they have bought or intend to buy 10,000 tons. Of the total, 6000 tons has been placed and 4000 tons is to be purchased, bids to be taken Feb. 20. Rockford, Ill., on the same day, will take bids on 450 tons. A few other inquiries previously mentioned, but not yet reported as placed, give the pipe business a better aspect than appears in most lines.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $64.80; 6-in. and larger, $61.80; class A and gas pipe, $1 extra.

Plates.—The mills have enough orders on hand to carry them a few weeks, and some prompt delivery business is coming out, but not nearly enough to equal shipments. There is no disposition on the part of consumers to make contracts and the mills are not urging them to do so.

The mill quotation is 3c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Bars.—The makers of mild steel bars are in a fairly comfortable position for a month or six weeks, and, as with other products, prompt shipment orders of limited size are being placed. Bar iron is quiet but firm at 2.65c. Pittsburgh, or 2.90c. Chicago, this being lower than the steel bar quotation. Rail carbon bars show a tendency toward betterment.

Mill prices are: Mild steel bars, 2.75c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.92c., Chicago; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.80c., Pittsburgh.

Old Material.—Still lower levels have been reached. The market continues quiet in nearly all directions, although melting steel can be placed, and there has been some rather extensive buying of scrap by a large local maker of agricultural implements. The latter circum-

stance is responsible for the comparative strength of No. 1 cast. For the rolling mill grades, there is almost no demand. Railroad offerings are becoming heavy, and a fair tonnage of rerollers is included, but the demand for these is light. Good sized lists are offered by the Toledo, St. Louis & Western, the Chicago, St. Paul, Minneapolis & Omaha, the Belt of Chicago, the Chicago & Alton, and the Lake Erie & Western railroads.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$22.00 to $23.00
Relaying rails	45.00 to 50.00
Carwheels	22.00 to 23.00
Steel rails, rerolling	15.50 to 16.50
Steel rails, less than 3 ft	16.00 to 17.00
Heavy melting steel	14.50 to 15.00
Frogs, switches and guards, cut apart	14.50 to 15.00
Shoveling steel	13.50 to 14.00
Per Net Ton	
Iron angles and splice bars	19.00 to 20.00
Steel angle bars	13.00 to 14.00
Iron arch bars and transoms	21.50 to 22.50
Iron car axles	26.00 to 27.00
Steel car axles	22.00 to 23.00
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	13.50 to 14.00
Cut forge	13.50 to 14.00
Pipes and flues	11.00 to 11.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	7.00 to 7.50
Steel knuckles and couplers	16.50 to 17.00
Coil springs	18.00 to 18.50
No. 1 cast	19.50 to 20.00
Boiler punchings	19.00 to 20.00
Locomotive tires, smooth	17.00 to 18.00
Machine shop turnings	5.00 to 6.00
Cast borings	6.50 to 7.00
Stove plate and light cast	15.00 to 15.50
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00
Railroad malleable	14.50 to 15.50
Agricultural malleable	13.50 to 14.00
Country mixed	10.00 to 11.00

Wire Products.—The situation which has prevailed for weeks still holds. Small-lot buying for immediate need is the rule. For prices, see finished iron and steel, f. o. b., Pittsburgh, page ——.

Bolts and Nuts.—The makers are working hard to keep their plants employed, but they find it difficult to build up any reserve of orders in the face of a determination on the part of consumers to buy in small quantities pending the arrival of lower prices. For mill prices see finished iron and steel, f. o. b., Pittsburgh, page 522.

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅞ x 4 in., 40 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 35 off; larger sizes, 20 and 5 off; hex pressed nuts, square topped, 7.8c. off; hexagon tapped, 5.7c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

Sheets.—The inquiry for sheets, mostly in small lots, is relatively better than for either forms of steel, but the mills which are running fully have but little ahead of them.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c., and No. 28 galvanized, 7.57c.

Mill quotations are 4.70c. for No. 28 black, 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Rails and Track Supplies.—Railroads which have rails on order are showing a lively interest in spikes, bolts and angle bars, as they are anxious to get busy with track work as soon as the weather permits. All are willing to go ahead, if permitted, but Washington is not taking a favorable view of new rail orders, and the roads not having rails coming to them on contracts are in a peculiar position.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3c., Pittsburgh and Chicago; tie plates, iron, 3.30c., f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Philadelphia

PHILADELPHIA, Feb. 18.

Buyers and sellers seem to be getting no nearer together, and orders for steel, pig iron, ferroalloys and scrap are relatively few in number and small as to tonnages. A steel company has canvassed a number of leading Eastern steel consumers in an attempt to determine causes for the present lack of buying interest, and it was found that primarily consumers are staying out of the market because of expectations of lower prices. A secondary reason for lack of buying interest is the fact that, as a general rule, consumers have ample stocks on hand to cover requirements of the next two or three months.

Secretary Redfield's plan for stabilizing prices and reviving buying has aroused interest, but is met with some skepticism. Artificial stimulation of the market, it is believed by some, would not achieve the desired goal. It is pointed out that nothing the Government could do to bring about increased activity in the steel business would have as beneficial effect as resumption of buying by the railroads. If the Railroad Administration, the railroads and the steel companies should agree on fair prices at which large purchases of railroad steel could be closed it would encourage all buyers to go ahead. It is admitted that such agreed prices must be lower than mills are now quoting. The steel companies do not seem to be adverse to reducing prices if they could feel sure that such reductions would readily stimulate buying.

Eastern steel manufacturers are disturbed by the proposal of the Railroad Administration to change freight rates to a mileage basis, as such a change would increase the rates paid by Eastern mills on shipments to Philadelphia and to other points eastward, while the Pittsburgh-Philadelphia rate would be increased only ½c. per 100 lb. and the Pittsburgh-New York rate would be a half cent lower than at present. In normal times the chief advantage that Eastern mills have is the freight differential, and this advantage would be partially overcome in favor of Pittsburgh mills by the change to a mileage basis.

The City of Philadelphia will inaugurate at once a campaign of new construction, which will include elevated railroad extensions, water works extensions, sewerage, bridges, highways, a municipal pier, etc.

Ferroalloys.—A few small sales of resale material are being made, but otherwise the market is as dull as it has been for many weeks. Ferromanganese, 70 per cent, may nominally be quoted at $175 to $200, though a resale is reported from the Pittsburgh district at $150. Spiegeleisen, 16 to 18 per cent, is nominal at $50 to $60, f. o. b. furnace. A Philadelphia importer last week received 1500 tons of British ferromanganese, which was applied on old contracts.

Coke.—Blast furnace coke of standard quality is obtainable for spot shipment or on contract at $4 a ton. Foundry coke has not been selling freely in this market, but quotations of $5.50 to $6 are heard.

Billets.—There have been inquiries for export, but little business has been closed, consumers evidently having expectations of lower prices soon. We quote open-hearth rerolling billets at $47.50, Philadelphia.

Bar Iron.—Eastern bar iron makers have formally reduced prices as follows: Common merchant iron, made from all scrap, from 3.50c. to 2.90c.; refined iron, made from all selected wrought scrap, from 4.25c. to 3.65c.; best refined iron, made from puddle bar and selected wrought scrap, from 5c. to 3.90c., all f. o. b. Pittsburgh. Western mills have been quoting these prices for shipment to the East for the last few weeks. To the above prices should be added a freight rate of 24½c. per 100 lb. to arrive at the Philadelphia delivered price.

Bolts, Nuts and Rivets.—A Pittsburgh maker has been offering an extra 5 per cent dividend and Eastern shipyards have bought boiler and hull rivets on that basis. A meeting of makers will be held in Pittsburgh on Wednesday and may result in formal reductions by the entire trade.

Plates.—Mill schedules are further cut into by orders from certain shipyards asking for suspension of shipments. Many of the shipyards have large steel stocks on hand. A Pennsylvania buyer of plates is reported to have offered a small tonnage to several mills at 2.75c., Pittsburgh, without finding one willing to cut the price. Oil companies are placing orders for the erection of oil tanks. We quote sheared plates, ¼ in. and heavier, at 3.245c., Philadelphia.

Pig Iron.—An inquiry for 3000 tons of copper-bearing low phosphorus iron for China has not yet been closed. The New York steel export company which put out the inquiry received a number of quotations, all of which were too high to interest the prospective buyer. Pig iron business is exceedingly dull, scarcely any orders being placed, not even for small tonnages. Nearly every seller of iron in this market has heard reports that a few eastern Pennsylvania furnaces are now willing to sell on an actual f. o. b. furnace basis, dropping the Pittsburgh basing, but apparently no such open quotations are yet being made. One furnace has offered No. 2 plain iron for export at $33.10 f. a. s. Philadelphia. We quote standard grades of iron delivered in Philadelphia or vicinity as follows:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$36.15
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	34.90
Virginia No. 2 X (2.25 to 2.75 sil.)	36.35
Virginia No. 2 plain (1.75 to 2.25 sil.)	35.10
Basic	33.90
Gray forge	33.90
Standard low phosphorus	51.90
Copper-bearing low phosphorus	48.90

Structural Material.—The low bidder for the pier to be built by the city of Philadelphia is the F. W. Mark Construction Co. There were 65 bidders. About 1200 tons of fabricated steel will be required. No other building projects of importance are before the trade. Plain material is quoted at 3.045c., Philadelphia.

Steel Bars.—Jobbers continue to buy freely, though in small lots. We quote soft steel bars at 2.945c., Philadelphia.

Sheets.—Sheet mills are busier than other departments of the steel industry, but new orders are not coming in freely. We quote No. 10 blue annealed sheets at 4.145c.; No. 28 black at 4.945c., and No. 28 galvanized at 6.295c., all delivered Philadelphia.

Old Material.—The scrap market is dull and prices are lower. An eastern Pennsylvania consumer has bought heavy melting steel at $14, delivered, and blast furnace borings and turnings at $8.50, delivered. Only $8 is now being offered for borings and turnings by this consumer. Low phosphorus melting stock is a drug on the market. No. 1 railroad wrought is down to $20. Scrap dealers are finding present low prices attractive for speculative purposes, and some are filling their yards with material which they expect to hold for higher prices. We quote for delivery at consumers' works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel	$14.00 to $15.00
Steel rails, rerolling	17.00 to 17.50
No. 1 low phosphorus, heavy, 0.04 and under	20.00 to 22.00
Iron rails	24.00 to 25.00
Carwheels	23.00 to 25.00
No. 1 railroad wrought	20.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	17.00 to 18.00
No. 2 busheling	13.00 to 14.00
Turnings (for blast furnace use)	8.50 to 9.50
Machine-shop turnings (for rolling mill use)	10.00 to 11.00
Cast borings (for blast furnace use)	8.50 to 9.50
Cast borings (clean)	12.50 to 13.50
No. 1 cast	23.00 to 24.00
Grate bars	18.00 to 20.00
Stove plate	18.00 to 20.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 18.00
Ungraded pipe	14.00 to 16.00

Birmingham

BIRMINGHAM, ALA., Feb. 17.

Pig Iron.—The Southern iron market is stagnant. No other word fits the situation. One interest reports sales of 700 tons in several lots during the week on the $31 base and the leading foundry interest sold carload lots at the late Government price. There were several inquiries for export, but no orders were booked and it has not yet developed whether present ocean rates will permit revival of that business. Exportation of billets at present rates is reported as out of the question by the Gulf States Steel Co., which does not look for revival of the export business until rates are $1[illegible] per ton. The Woodward Iron Co. blew out the only active Vanderbilt stack and now has only two of its five on the active list. Asked why this action had been taken, President Frank Crockard said: "There is no demand for iron. We will blow in again when there is a demand. We have piled very little metal, and we do not intend to accumulate." The American Steel & Wire Co. and Tennessee company are on normal full turn and the latter will soon ship steel shapes from its new Fairfield mills to be made into ships at Mobile. Foundries are reported as taking iron at times and in quantities specified in orders, and in some cases there are anticipations. Increase in stocks in January was slight and it is probable that the make is being moved. There is no longer question that $31 is the basic Birmingham price. The question is, will it go lower in order to induce a start toward buying? We quote per gross ton f. o. b. Birmingham district furnaces as follows:

Foundry, 1.25 to 2.25 silicon	$31.00
Basic	30.00

Coal and Coke.—There has been a decrease in coal production and this time it is owing to let-up in demand. Furnaces have plenty of coke, owing to the number of shut-downs. Good foundry is in good demand and the war prices prevail.

Pipe.—The outlook in the water and sanitary pipe market is better than in many weeks. One company has listed a western city order and another has taken on some new business from municipalities. The Southwest has sent in orders for oil and gas pipe to the leading interest.

Old Material.—The scrap market has been beaten down to the low levels of the summer of 1916 and local dealers are taking more interest in specials than in the regular line of business. In order to maintain their lead, the large consumers have purchased considerable outside material. Local transactions have not been large. We quote per gross ton f. o. b., Birmingham district yards, prices to consumers as follows:

Old steel axles	$28.00 to $30.00
Old steel rails	11.00 to 11.50
Heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	20.00 to 21.00
No. 1 cast	20.00 to 20.50
Carwheels	20.00 to 20.50
Tramcar wheels	19.50 to 20.00
Machine shop turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Stove plate	13.00 to 13.50

Buffalo

BUFFALO, Feb. 18.

Pig Iron.—Dull conditions continue to prevail in this market, with very light demand. The business of furnacemen is now very largely confined to shipping on old contracts, because of the very slight amount of new business developing, and producers state they would prefer to shut down rather than pile stocks at high cost. Such inquiry as is received is chiefly for foundry iron in small tonnages, carloads and 50 to 100-ton lots, with very limited inquiry for basic. Some consumers intimate that with the better quality of coke now obtainable, furnace output shows noticeable improvement in quality in some instances and iron is coming forward more nearly to specification desired. Some consideration is being given by furnacemen to the possibility of reconstituting price regulation of pig iron by the Government, as the positive stabilization thus assured would have a stimulating effect. We quote the price schedule as follows, f. o. b. furnace, Buffalo:

No. 1 foundry 2.75 to 3.25 silicon	$34.40
No. 2 X, 2.25 to 2.75 silicon	32.25
No. 2 plain foundry, 1.75 to 2.25 silicon	31.90
Gray forge	30.00
Malleable silicon not over 2.25	31.50
Basic, 1 to 1½ per cent mug	30.50
Basic, 1½ to 2½ per cent mug	31.00
Bessemer	32.25
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Finished Iron and Steel.—The buying sentiment is a little better in this district. Inquiries have increased and also actual tonnage placed for immediate require-

ments, and a more confident feeling appears to be developing. Jobbers are evening up their stocks more freely, replenishing to cover the low spots and equalizing for actual day to day requirements. The volume of business placed directly by manufacturers is not large, but indicates the necessity for the purchase of materials to enable them to fill orders which they are now getting.

Old Material.—The market continues dull and apathetic so far as local buying is concerned, without inquiry from consumers of the district in any line except for stove plate, for which tonnages of small volume are being inquired for. There is not much stove plate on hand, and the price has stiffened somewhat. Some sales have been made to points outside the district of turnings and borings and heavy melting steel, although small in aggregate volume. We quote as follows, per gross ton, f. o. b., Buffalo:

Heavy melting steel, regular grades	$14.00 to $15.00
Low phosphorus, 0.04 and under	19.00 to 20.00
No. 1 railroad wrought	18.00 to 19.00
No. 1 machinery cast	21.00 to 22.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	19.00 to 20.00
Machine shop turnings	7.50 to 8.00
Heavy axle turnings	13.00 to 14.00
Clean cast borings	11.00 to 12.00
Iron rails	21.00 to 22.00
Locomotive grate bars	16.00 to 17.00
Stove plate	17.00 to 18.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping	11.00 to 12.00

St. Louis

ST. LOUIS, Mo., Feb. 17.

Pig Iron.—While there is some increase of interest in the pig iron market, there has been no buying of consequence during the past week. Actual purchases were of small lots of immediate need material. The aggregate was not large. There is a disposition to take careful account of conditions which seem to indicate that the melters have plans in view which will lead to increasing business with the coming of spring. Pig iron under contract is being very generally taken in without demur, especially since most of the furnaces have agreed to apply the reduced pig iron price.

Coke.—Coke business continues dull, consumers taking in all contracted for, but showing no disposition to make any new purchases, particularly as they have no pressing needs.

Finished Iron and Steel.—While no contracts for finished products are being made for future delivery, there is a steady increase in the general buying movement and the principal interest reports a satisfactory development of business on immediate and early shipment material on which very satisfactory deliveries are being made. This tendency is reported quite general over the trade territory tributary to this market, and is regarded as evidence that with coming of spring operations a good business will develop—not up to boom times, of course, but good in comparison with the conditions prevailing in 1914. Movement out of warehouse is quiet but steady, with the prices for such stock quoted as follows: Soft steel bars, 4.04c.; iron bars, 4.04c.; structural material, 4.14c.; tank plates, 4.34c.; No. 8 sheets, 5.19c.; No. 10 blue annealed sheets, 5.24c.; No. 28 black sheets, cold rolled, one pass, 6.29c.; No. 28 galvanized sheets, black sheet gage, 7.64c.

Old Material.—The scrap market has continued to show the same characteristics as have been previously reported. Locally the shutting down of one of the American Steel Foundries plants, due to cancellation of war orders, had a depressing effect on the scrap dealers, while the general lack of demand from other sources was similar in its influence. Dealers are avoiding transactions except those of the most necessary character, and quotations made are mostly, as for some time past, estimates rather than the results of actual transactions. Little business in this field is looked for by dealers until the spring activities are well under way. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$22.00 to $23.00
Old steel rails, rerolling	16.00 to 17.00
Old steel rails, less than 3 ft	16.50 to 17.00
Relaying rails, standrad sections, subject to inspection	40.00 to 45.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	14.50 to 15.00
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart	14.50 to 15.00
Ordinary bundled sheet scrap	9.00 to 9.50
Heavy axle and tire turnings	8.00 to 8.50
Per Net Ton	
Iron angle bars	$17.00 to $17.50
Steel angle bars	15.00 to 15.50
Iron car axles	24.00 to 24.50
Steel car axles	23.00 to 23.50
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	15.50 to 16.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	13.00 to 13.50
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	8.00 to 8.50
No. 1 busheling	12.50 to 13.00
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	16.50 to 17.00
Stove plate and light cast	12.00 to 12.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.00 to 11.50
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	7.00 to 7.50
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.00 to 12.50
Horseshoes	13.50 to 14.00

San Francisco

SAN FRANCISCO, Feb. 12.

Capt. Robert Dollar is authority for the statement that the Chinese Government will purchase $10 000,000 worth of steel, steel products, shipyard supplies and machinery before the end of the year to use in the steel ships which China is building for this country. Perhaps $1,000,000 worth of these orders will be placed on the Pacific Coast, but the rest will go to the Atlantic on account of the favorable shipping rates from the Eastern coast through the canal to China.

During the Seattle strike and the uneasy labor market in this State, the Pacific Coast Steel Co. and some of the other larger producers have been cutting down on their production. This has had a serious effect throughout the trade.

Finished Materials.—Bars are quiet under lighter demands. A number of building propositions are said to be waiting a lower price on structurals and all building materials to start work in this city. Lumber was marked down 20 per cent on Feb. 10. Plates are not moving in this market. The jobbers have a fair supply, and they are holding at prices that will give them a reasonable profit over their costs, but the demand is dead. Sheets are a little better in demand. For galvanized a demand has arisen in the country, and the jobbers say that they expect to see this demand increase.

Pipe.—No large enterprises using wrought pipe are announced. The users of pipe are waiting to see if further reductions in price are to be looked for in the near future. There is no change in the situation regarding cast iron pipe. A great deal of business is known to be held up, and it is a question if it can be held back long enough to make a material difference in the eventual costs.

Pig Iron.—The market for pig on the Coast is unchanged. Occasionally a small lot of pig is sold here at prices independent of the Eastern prices, but the regular price for pig iron here is the Southern furnace price plus the freight. During October of last year, a lot of 400 tons sold at $32 per ton gross; another lot of 150 tons sold at $33, and a third lot, also of 150 tons, sold at $31.75. These were isolated sales, however, and could hardly be taken as representing the

market at that time, any more than the purchase of a large amount of Chinese iron in 1914 at $17.25 f.o.b. San Francisco could have been regarded as making the market. This Chinese iron, bought in 1914, was not all delivered until about a year ago. The purchase was more or less of a speculative nature, and the seller is said to have lost heavily on the deal on account of the advancing freight rates. No pig iron is being offered in the open market here at the present time.

Coke.—Coke is now coming in in quantities that meet all the needs of the local mills, foundries and shops. Last year's prices are being maintained, and most of the coke coming in is on contracts.

Old Materials.—The mills are buying only a limited quantity of scrap. They have large reserves, and they are using up these surpluses when they cannot get scrap at what they consider a fair price. The mills are now paying about $18 per gross ton for the ordinary run of scrap. This is unsorted steel and iron scrap of all sorts mixed. The foundries use cast iron scrap almost exclusively, and for this they are paying $35 per net ton.

British Iron and Steel Market

American Competition in Tin Plate—Fuel and Labor Shortage at Blast Furnaces

(By Cable)

LONDON, ENGLAND, Feb. 18.

American competition in tin plates is increasing. They have been sold at 78s. ($18.55) c.i.f. Lisbon, and sales by American producers have also been made to Norway and the Far East. Good colonial orders for locomotives have been placed in America because of the labor position here. Australia is inquiring for 20,000 tons of rails.

An American group is reported as negotiating for the Differdingen mines and works. The Comptoir Siderurgique de France has been formed, comprising all French rolling mills, and probably centralizing the sale of all rolled products. It is estimated that the repairs to French collieries will take 10 years and cost £80,000,000.

Blast furnaces are working irregularly, owing to fuel and labor shortage, with domestic supplies insufficient. The outlook for increased production is unsatisfactory, some foundries shutting down for lack of iron. Official control of ore chartering ceases March 1 for South Spain and the Mediterranean, and on March 15 for North Spain. The allowance for steel for tin plate mills has been increased 15 per cent and the output has increased and is now 60 per cent.

The Lorraine pig-iron output for the first ten months of 1918 was 1,494,000 tons, as compared with 2,020,000 and 2,061,000 in the years 1917 and 1916, respectively. The pig-iron production in Luxemburg to Nov. 1, 1918, was 1,184,000 tons as compared with an output in 1917 and 1916 of 1,541,000 and 1,957,000 tons respectively. The corresponding output in the Saar basin was 709,000 tons for the first ten months of 1918 as against 898,000 and 944,000 tons for all of 1917 and 1916, respectively.

Following are the government fixed prices for steel per gross ton except where otherwise stated, f.o.b. makers' works, the figures in parentheses being the official domestic prices and the others the official export prices:

Hematite pig iron: East Coast £8 12s. 6d. (£6 2s. 6d.); West Coast, £8 17s. 6d. (£6 7s. 6d.).
Ship, bridge and tank plates, £16 10s. (£14).
Boiler plates, £17 10s. (£15).
Ship, bridge and tank plates, thin, £19 10s. (£16).
Small angles, tees and flats £20 (£16 10s.).
Beams, £16 2s. 6d. (£13 12s. 6d.).
Rails, 60 lb. per yd. and upward, £15 10s. (£13 7s. 6d.).
Rounds, squares and hexagons, £17 10s. (£14 5s.).
Billets and slabs for rolling, £13 10s. (£11 12s. 6d.).
Billets and slabs for forging, £15 (£12 15s.).
Bar iron, £20.
Tin plate, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 40s. to neutral countries; otherwise, 33s. 3d.
Tin plate bars (£12 5s. 9d.).

New York

NEW YORK, Feb. 18.

Pig Iron.—Inquiries for a considerable tonnage of iron for export including 3000 tons for China are pending, but no orders have been reported closed and it is evident that it will be necessary to lower prices before meeting foreign competition. In fact, some shading has already been done. As to both foreign and domestic business, the market is very quiet with the exception of limited buying for immediate delivery and the general feeling is that the trend of prices is downward, but that some buying will be done while prices descend. An interesting feature of the situation is the success of the charcoal pig iron manufacturers in maintaining prices. They assert that as they have contracted for their ore and charcoal through the first half of the year, it is imperative for them to maintain quotations as they existed at the close of the old year and it seems probable that they will succeed in doing so for delivery through the first half. We quote prices as follows for tidewater delivery for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25 ..... $37.90
No. 2 X, silicon, 2.25 to 2.75 ..... 36.15
No. 2 plain, silicon, 1.75 to 2.25 ..... 34.90
No. 2 X, Virginia, silicon, 2.25 to 2.75 ..... 36.65
No. 1 Southern, silicon, 2.75 to 3.25 ..... 41.70
No. 2 Southern (all rail), silicon, 2.25 to 2.75, 39.95
No. 2 Southern (all rail), silicon, 1.75 to 2.25, 38.70

Cast-Iron Pipe.—With the exception of 1500 tons for Bayonne, N. J., on which bids will be received next Friday, there is no large tonnage in the market, but it is evident that the agitation in favor of municipalities letting contracts for pipe in order to give employment to men is having effect and a number of cities are figuring on buying at a not far distant date. Prices for 6-in. and heavier are $62.70, New York; for 4-in. $65.70; for 3-in., $72.70, and $1 additional for class A and gas pipe.

Ferroalloys.—Inquiry for ferromanganese has been more active in the last week than for some little time, but it is confined to small lots for early delivery, running up to 100 tons. The quotation on such quantities and deliveries is fairly firm at $175 to $200, delivered. There have been a few sales. It is understood, however, that offerings have been made of resale alloy at $150, with no sales reported, the quotation being regarded in many cases as a matter of testing values for fixing losses. Many of the large producers are still asking $225, delivered Production in January, according to the blast furnace reports of THE IRON AGE was 21,331 tons, which is much larger than was generally expected. The spiegeleisen output was 11,456 tons last month, or the lowest in many months. Inquiry for spiegeleisen is reported as better, but not particularly active. Quotations are unchanged at $60 to $65, delivered, depending on the quantity and the analysis, with some small lots sold at about the former quotation. The 50 per cent ferrosilicon market is difficult to gage, there being insufficient demand to test the market. Quotations generally range from $100 to $125 per ton, depending on the quantity desired and the time of delivery, with resale offerings affecting values.

Finished Iron and Steel.—Conditions in the steel trade show no material change from those which have prevailed for several weeks, except that fewer orders are being placed. Export trade has come almost to a standstill. Although there are many export inquiries in the market, and some for large tonnages, notably one for 30 000 tons of rails, sellers see no hope of closing anything of importance at present prices and present ocean freights. Sellers are now fully imbued with the idea that selling prices must come down, but apparently no one desires to be the first to make the cut. Secretary Redfield's plan for stabilizing prices for leading commodities has created discussion, both favorable and unfavorable. One view is that there should be no further concerted action on steel prices, but that the laws of supply and demand should be permitted to govern. The shutting down of all departments of the Donner Steel Co., Buffalo, except the blast furnaces, is an indication of the effect which lack of business is

having upon operations of plants. Many of the independent steel companies are running at from 50 to 60 per cent. Orders for 5000 cars for France have been released to car builders, these being a part of the 20,000 military cars which the director of military railways ordered before the armistice was signed. It has been expected that France would eventually take all of the 20,000. The American Locomotive Co. has received an order from the Canadian National Railway for 25 Pacific type locomotives. Very little of the surplus material which the governments of Great Britain and France have on hand has been disposed of as yet, consumers not being willing to pay the prices which have been asked. The British War Mission will export some of the finished and semi-finished steel to England rather than accept too large a loss. Eastern bar iron makers have reduced prices, the new quotations being 2.90c. for common merchant iron, 3.65c. for refined iron made from selected scrap and 3.90c. for best refined iron made from puddled iron and selected scrap. For delivery in New York a freight rate of 27c. per 100 lb. is added to these prices. The new prices, though announced a week ago, have not brought any business of any account as yet. Structural steel inquiry is very light. The New England Structural Co., Boston, has been awarded the contract for a 300-ton steel storage shed at the Boston Navy Yard. The F. W. Mark Construction Co. was low bidder for a municipal pier in Philadelphia, requiring about 1200 tons of steel. There were only two bidders on 1200 tons of steel required for crane runways at the League Island Navy Yard, Philadelphia. The American Bridge Co. was low bidder, but the work has not yet been let. An inquiry is out for 200 tons more for crane runways at the League Island Navy Yard. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.27c.; common bar iron, 3.17c.; refined bar iron, from selected scrap, 3.92c., and best refined iron, 4.17c., all New York. Out-of-store prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets, 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent off list.

Old Material.—An excess of sellers and a dearth of buyers are still making the market trend downward with the bottom still unfathomed. Pessimism was generally found among dealers and brokers when interview because of the scarcity of inquiry and the absence of sales. A broker reported an inquiry from a mill which contained many "ifs." The mill asked if heavy melting steel could be bought at $12.50 delivered (equivalent to about $9.50, New York) if the mill should decide it wished it. This illustrates how consumers are merely nibbling at the large stocks of scrap for sale. Prices brokers are quoting to the few inquiries per gross ton, New York, follow:

Heavy melting steel	$10.00 to $11.00
Relaying rails	13.50 to 14.00
Relaying rails, nominal	50.00 to 55.00
Iron and steel car axles	19.00 to 21.00
No. 1 railroad wrought	17.00 to 18.00
Wrought-iron track	12.00 to 13.00
Forge fire	9.00 to 10.00
No. 1 yard wrought, long	15.00 to 16.00
Light iron	5.00 to 6.00
Cast borings (clean)	9.00 to 10.00
Machine shop turnings	6.00 to 7.00
Mixed borings and turnings	5.00 to 6.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	12.00 to 13.00
Stove plate	14.00 to 15.00
Locomotive grate bars	13.00 to 14.00
Malleable cast (railroad)	14.00 to 15.00
No. 1 wheels	22.00 to 23.00

Prices which brokers are quoting to dealers in New York and Brooklyn, per gross ton, are:

No. 1 machinery cast	$20.50 to $21.50
No. 1 heavy cast (columns, building materials etc.) cupola size	16.50 to 17.50
No. 1 heavy cast, not cupola size	14.50 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.50

After being idle for more than a month, the Logan Iron & Steel Co.'s plant at Burnham, Pa., resumed operations on Feb. 6. Six hundred and fifty men were affected when a few formed a union and struck for higher wages, which were refused.

Cincinnati

CINCINNATI, Feb. 18—(*By Wire*).

Pig Iron.—The mails of different selling agencies this week rarely include inquiries for more than two or three carload lots of foundry iron. Business is practically at a standstill and there are no indications of an early change at the present time. Most Southern producers are now willing to take business at $31 Birmingham based on an analysis of 1.75 to 2.25 silicon. Southern Ohio is quoting a flat price of $31, but furnaces in that district are not selling any iron. A little silvery iron has changed hands and it is understood that the regular last Government price rules on all business placed. Steel making irons are as quiet as foundry grades and it is rumored that in some instances shipments have been held up by consumers so as to give them a chance to take care of stocks already on hand. Furnaces in all districts that are now in operation are piling iron.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, No. 1 foundry and 1 soft	$35.85
Southern coke, No. 2 foundry and 2 soft	34.60
Southern coke, No. 3 foundry	34.10
Southern No. 4 foundry	33.85
Southern gray forge	33.60
Ohio silvery, 8 per cent silicon	49.30
Southern Ohio coke, No. 1	34.05
Southern Ohio coke, No. 2	32.80
Southern Ohio coke, No. 3	32.30
Southern Ohio malleable Bessemer	33.30
Basic, Northern	31.80
Standard Southern carwheel	51.60

Old Material.—There is no demand for any kind of scrap, and prices are still softening although there have been no radical changes made within the past week. Some dealers profess to believe that the market is close to the bottom while others look for further reductions. A comparison of values with this time last year shows that some grades of scrap have been reduced fully 50 per cent. The following are dealers' prices f.o.b. cars Cincinnati and southern Ohio in carload lots.

	Per Gross Ton	
Bundled sheet	$ 9.50 to	$10.00
Old iron rails	24.50 to	25.00
Relaying rails, 50 lb. and up	40.00 to	41.00
Rerolling steel rails	15.00 to	16.00
Heavy melting steel	13.50 to	14.00
Steel rails for melting	14.00 to	14.50
Old carwheels	15.50 to	16.00
	Per Net Ton	
No. 1 railroad wrought	$13.50 to	$14.00
Cast borings	5.00 to	5.50
Steel turnings	5.00 to	5.50
Railroad cast	15.50 to	16.00
No. 1 machinery	17.50 to	18.00
Burnt scrap	11.00 to	11.50
Iron axles	25.00 to	25.50
Locomotive tires (smooth inside)	15.00 to	15.50
Pipes and flues	10.50 to	11.00
Malleable cast	11.00 to	11.50
Railroad tank and sheet	9.00 to	9.50

Coke.—The Connellsville market is especially weak and some high sulphur coke there could be picked up at low figures. However, standard brands of 48-hr. coke are quoted around $5 and 72-hr. around $6 to $6.50 per net ton at oven. New River operators are still clinging to a nominal figure of $8 at oven on both furnace and foundry grades, but of course are not selling any fuel at this figure. The general opinion in that market is that it would do no good to reduce prices because there is practically no demand for coke from any source. Wise County furnaces quote furnace coke around $7 to $7.25 and foundry around $8, but the same situation exists in that district as is noted in the New River field.

High-Speed Steel.—It is known that the Government has a large quantity of high speed steel contracted for or on hand, and an effort is being made to turn this back on the market in such quantities as will not disturb conditions. Just now the quotation on best brands of high speed steel is $1.90 per lb., but some brands are offered at $1.50.

Non-Ferrous Metal Scrap.—Prices on all kinds of copper and brass scrap are not at all firm, but some dealers do not look for any further reductions at an early date. Heavy copper is quoted around 13c. to

13¼c. per lb., and crucible copper around 13¼c. to 13½c. Lead is very dull around 4½c. There is a little better demand for blocked tin pipe and no advances in quotations have been made, but 55c. a lb. represents the average market.

Finished Material.—Wire nails are now quoted from jobbers' stocks at $3.10 per keg base, being a reduction of 15c. per 100 lb. within the last 30 days. The hardware dealers are buying nails quite freely, but their orders are smaller than usual. Structural material is not in very good demand, although there are frequent calls from stocks that are wanted for urgent work. Boiler plate is now easier to obtain, and as boiler makers are busier than for some time past, they have lately placed some very nice orders both with the mills and with the jobbers. There is still a good call for steel pipe, and while there is some improvement in shipments noted, they are not moving as fast as other materials. The sheet market is rather quiet, although the sheet metal contractors are now using more galvanized sheets than they have in some time.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.25½c., and wire nails, $4.15 per keg base.

Cleveland

CLEVELAND, Feb. 18.

Iron Ore.—Sellers do not look for an ore buying movement much before the opening of the season of navigation, and until consumers are ready to go in the market the price question will be given very little, if any, consideration. While wages have been reduced in the copper mines, nearly all the iron mining companies are maintaining recent wages. However, with the plentiful supply of labor, the miners are developing greater efficiency than during the past few months. We quote f. o. b., Lower Lake Docks, as follows:

Old range Bessemer, $6.65; old range non-Bessemer, $5.90; Mesaba Bessemer, $6.40; Mesaba non-Bessemer, $5.75.

Pig Iron.—With the exception of a few export inquiries, the pig iron market is practically at a standstill. One leading interest sold only 200 tons during the week. New export inquiries aggregating several thousand tons have come from Italy for low phosphorus Bessemer iron running 0.06 to 0.08 in phosphorus, Bessemer iron for Belgium and Bessemer and foundry grades for Japan. Regular prices have been quoted on these inquiries. Some resale basic iron is reported to have been offered in the Pittsburgh district at $29.50, and a number of consumers have asked Cleveland selling agencies to dispose of foundry iron that have been under contract, at slight concession in price. Furnaces are getting additional requests from foundries that contracts be canceled and that shipments be held up. The foundry situation shows no improvement, and the melt has not increased. Stock piles in many furnace yards are rapidly growing. One producer of Ohio silvery iron has formally reduced prices $3 a ton below the recent Government price. Some of this iron had previously been sold at a reduction, but this was mostly resale iron. We quote f. o. b. Cleveland as follows:

Bessemer	$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	46.90
Standard low phosphorus, Valley furnace	51.00

Coke.—In spite of reports of lower prices on coke loaded on cars in the Connellsville district, local sellers have no prices lower than $6 per net ton at oven for the best grades of Connellsville foundry coke. Cleveland by-products coke is quoted at $6 Connellsville for outside shipment. The demand is limited to an occasional sale of a carload.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is still light, although some manufacturers report a slight improvement. Consumers are buying only for immediate requirements. There is no demand from jobbers. Prices are being maintained. The rivet market is weak and irregular. One manufacturer is openly quoting structural rivets at 4.20c. and boiler rivets at 4.30c., or $4 per ton lower than regular prices. The Bolt, Nut and Rivet Institute will hold a meeting in Pittsburgh Wednesday, and it is expected that, after the situation is canvassed, there will be a general reduction in rivet prices.

Alloy Steel.—The demand from automobile manufacturers is improving, but under the keen competition prices are irregular and continue to work downward. Two Cleveland mills are now largely engaged on the conversion of alloy steel. A Cleveland manufacturer is inquiring for 3000 tons of chrome-silicon-manganese steel. The demand for electric steel is light, and mills are eager for orders to keep furnaces in operation. Open-hearth alloy steel bars are quoted as follows: 3½ per cent nickel, 6¾ to 7c.; chrome vanadium, 7c.; chrome nickel, 1½ per cent nickel, 6½ to 6¾c.

Old Material.—Scrap continues to decline and dealers are wondering how much lower it will go. A great deal of material is being placed on the market at present low prices, the general disposition of producers being to sell their scrap for whatever prices they can get. A Cleveland mill is offering $12 for round tonnage of heavy melting steel, which is out of line with present prices, although this grade has sold as low as $13.50. Most of the heavy melting steel that is moving is now being shipped out of the city. A northern Ohio mill which has been buying this grade on declining market has made late purchases at $14.50. A Pittsburgh district mill has purchased 5000 tons of turnings at $9 per gross ton, delivered. A Cleveland mill has bought turnings at $7.50, and sales to dealers have been made as low as $7. There is no demand for low phosphorus melting scrap and no prices on this grade. Wrought, malleable and cast scrap are inactive. Cast iron car wheels have been sold at $15.50. Dealers quote delivered to consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$14.00 to $14.50
Steel rails, under 3 ft.	19.00 to 19.50
Steel rails, re-rolling	16.00 to 16.50
Iron rails	24.00 to 25.00
Iron car axles	31.00 to 32.00
Steel car axles	31.00 to 32.00
Low phosphorus melting scrap, nominal	17.00 to 18.00
Cast borings	10.00 to 10.50
Iron and steel turnings and drillings	7.00 to 8.00
Compressed steel	12.00 to 13.00
No. 1 railroad wrought	17.00 to 18.00
Cast iron car wheels	15.50 to 16.00
Agricultural malleable	14.00 to 14.50
Railroad malleable	14.00 to 14.50
Steel axle turnings	12.00 to 12.50
Light bundled sheet scrap	8.00 to 9.00
No. 1 cast	20.00 to 21.00
No. 1 busheling	14.00 to 15.00
Railroad grate bars	14.50 to 15.50
Stove plate	14.00 to 14.50

Finished Iron and Steel.—The volume of inquiry for finished steel has increased, but a large share of buyers are holding off in the placing of orders except for immediate requirements, and consumers are becoming more insistent that prices be lowered. Considerable resale steel in small lots is being offered in steel bars, plates, sheets and shafting. Hard steel bars have been resold at 1.75c. and lower. A weakening of the semi-finished steel market is reported in the sale of a round lot of slabs to a Cleveland mill. Makers of strip steel are competing with sheet mills for blue annealed sheet orders, which at the 3.30c. base make the price lower for certain widths than the regular sheet prices. Hard steel bars rerolled from shell steel are being offered around 2.25c. The automobile and tractor manufacturers continue to place orders freely. Orders will be placed shortly for 2300 tons of plates and shapes for one of the new blast furnaces to be built in India by a Cleveland firm, and a local shipyard is inquiring for 500 tons of plates for New York canal barges. Bar iron is quiet and is now quoted at 2.90c., but local mills are not trying to meet competition in Eastern and Western territories. Boiler tubes are in

d demand for repair work. Warehouse prices are follows:

Steel bars, plates, 4.17c.; structural material, No. 10 annealed sheets, 5.07c.; No. 28 black No. 28 galvanized sheets, 7.47c.

IRON AND INDUSTRIAL STOCKS

Market Reacts Slightly Upward on Account of Forced Buying by Short Interests

NEW YORK, Feb. 17.

The failure of holders of securities to sell their investments in sufficient amounts compelled short sellers to buy again, and this involuntary purchasing in turn acted to hold the market from further decline, despite the decrease in uncompleted Steel Corporation orders and the unsatisfactory report of American Can. United States Steel common fell to 88¼ on Feb. 10, but closed the week at 91⅞.

The range of prices in active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

American Can com.	31 - 34⅝	Int. Har. pf.	115 - 117
American Can pf.	82½ - 85	Lackaw. Steel	64½ - 67
Am. Car & Fdy. com.	44⅝ - 45⅝	Lake Supr. Corp.	19¼ - 21
Am. Car & F. pf.	100½ - 101	Midvale Steel	41½ - 42¼
Am. Car & F. pf.	87⅛ - 90⅞	Nat.-Acme	30 - 31
Am. Car & F. pf.	114½ - 115½	Nat. En. & St. c.	45¼ - 50⅜
Am. Loco. com.	60 - 64	Nat. En. & St. pf.	96⅛ - 97½
Am. Loco. pf.	103¼ - 104¼	N. Y. Air Brake	96 - 97
Am. Radiator com.	285	Pittsbgh. Steel pf.	94
Am. Sug. com.	100 - 100¼	Pressed Steel c.	59⅜ - 62½
Am. Steel Fdries.	75½ - 77½	Ry. Steel Spg. c.	71½ - 73⅝
Am. Tel. & T. c.	99¼ - 99⅝	Republic com.	72¾ - 75
Am. Steel com.	60¼ - 62⅜	Republic pf.	102
Am. Steel ct. B	59⅞ - 62⅛	Sloss com.	48 - 50
Am. Ty. pf.	93 - 93⅝	Sloss pf.	87½
Am. Woolen com.	63	Superior Steel	34½ - 34¾
Am. Woolen pf.	35 - 37	Transue-Williams	38
Beth. Steel com.	54 - 58⅞	Un. Alloy Steel	39 - 39⅜
Beth. Steel pf.	92	U. S. Pipe com.	15⅛ - 16¼
Brooklyn U. G. & Co. pf.	93¾	U. S. Pipe pf.	46⅛ - 47½
Crucible Steel	149¾ - 152⅝	U. S. Steel com.	89½ - 92
Cuban Am. Sug. com.	27½ - 29⅜	U. S. Steel pf.	114 - 114⅜
Cuban Cane Sug.	53¾ - 54	Westingh. Elec.	41¾ - 43¼
Gen. Elec. com.	112 - 114		

Dividends

The American Laundry Machinery Co., quarterly, 1 per cent on the common, payable March 1, and 1¾ per cent on the preferred, payable April 15.

The General Fireproofing Co., quarterly, 1¾ per cent on the common and preferred, payable April 1.

The Moline Plow Co., quarterly, 1¾ per cent on the first preferred and 1¾ per cent on the second preferred, payable April 1.

No Reduction in Farm Implement Prices

Farm implements are not to be cheaper, despite a report to that effect which was recently printed.

"On the contrary," says Secretary E. W. McCullough of the National Implement and Vehicle Association, "it is the opinion of the officers of our association that present price levels cannot be substantially reduced without serious or even disastrous losses to the manufacturers until the stocks of raw materials which they bought and contracted for at war-time prices are worked up and marketed.

"The report recently sent out from Pittsburgh about cheaper farm implements was entirely mistaken. At a special meeting of the plow and tillage implement makers held there on Feb. 5, standardization of varieties was discussed as a means of economy, but nothing was said about present or future prices."

Smith & Wesson Plant Returned

The Smith & Wesson Co.'s plant at Springfield, Mass., has been returned to former owners by the Government and an inventory is in progress as a preliminary to the formal transfer of the property. Meanwhile the old officers of the company have resumed their duties but an announcement of future plans is for the present withheld. About 1400 men were discharged by the Government since the middle of December.

The annual meeting of stockholders of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, for the election of directors and such other business as may properly be brought before the meeting, will be held in that city on Wednesday, Feb. 26.

Disapproves of Government Price Stabilizing Plan

A movement in favor of stabilizing steel prices for fixed periods at substantially lower levels was inaugurated by the Pressed Metal Association at a meeting held in Cleveland, Feb. 17. The association is composed of makers of metal stampings, 60 per cent of the product going to the automobile industry, and consumes 600,000 tons of steel per annum in sheets, strip steel and plates. The condition of the steel market, the price situation and the general industrial situation were discussed at length, and the association expressed its views in a statement that was adopted by a unanimous vote. It was pointed out in this statement that there is at present a large potential buying power, but a general attitude of hesitancy in placing orders, due to the weakening of the market, and the belief was expressed that for economic reasons the price of steel and steel products must be reduced.

As the element of time is important, the association expressed itself as not in favor of the plan proposed by Secretary of Commerce Redfield for controlling prices, as that plan could not be carried out until after investigations that might require two or three months.

The association believes that were prices stabilized at substantially lower level for fixed periods, the present hesitancy would disappear and there would be a heavy buying of steel and steel products. Members of the association are now employing 60 per cent of their normal working forces, as compared with 90 per cent on Jan. 1, and the situation was reported as growing worse daily. Copies of the statement were wired to the American Iron and Steel Institute and the United States Steel Corporation, and will be mailed to over thirty trade organizations in the steel industry with the view of having these organizations back up the movement.

Polish Commercial and Industrial Bureau

To promote commercial relations between Poland and the United States, the Commercial and Industrial Bureau of the Polish National Department has opened headquarters at 33 West Forty-second Street, New York. Collection will be made of all data and information necessary to form a basis for the work of the future official Polish commercial agencies in this country, and to facilitate mutual economic relations. The bureau will give out news concerning trade conditions and business possibilities in Poland, and will take in names of parties interested. The bureau points out the vast field in that country for the export of American manufacturers, because of the devastation caused by the four years of war, and because of the necessity for this land to re-establish its production and thereby become a strong wall against German expansion to the East.

Taxes on Munitions

The Commissioner of Internal Revenue has given out the details of the taxes collected on the net profits of munition manufacturers. The amount collected in the fiscal year ending June 30, 1918, was $13,296,927.32, less than half of that for the preceding year when it totaled $27,663,939.63. The States paying the largest amounts were: Connecticut, $700,597; Delaware, $4,074,679; Illinois, $220,262; Massachusetts, $286,223; Michigan, $43,942; Missouri, $91,005; New Jersey, $127,005; New York, $2,286,530; Ohio, $638,167; Pennsylvania, $4,697,-101.

Crimora Manganese Property Changes Hands

The manganese ore deposits in Virginia formerly owned by the Crimora Manganese Corporation, Crimora, Va., and described in THE IRON AGE, March 30, 1916, were recently sold to the American Chemical & Industrial Companies, Philadelphia. The plant has been shut down for a time but it is understood an order for 10,000 tons of ore will enable operations to continue. The new company made important changes in the method of handling and concentrating the deposits and is able to turn out at least 75 tons per day.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.80c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barbed wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.40 base
Large boiler rivets.....$4.50
7/16 in. x 6 in. smaller and shorter rivets..
50-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads.....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts ¾ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads.....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts.....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts.....70-10 per cent off list
Stove bolts.....2½ per cent extra for bulk
Tire bolts.....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, per 100 lb., $3.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.05 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $14.50 per package; 8-lb. coating, I. C., $14.80; 12-lb. coating, I. C., $16.50; 15-lb. coating, I. C., $17.50; 20-lb. coating, I. C., $18.75; 25-lb. coating, I. C., $20.00; 30-lb. coating, I. C., $21.00; 35-lb. coating, I. C., $22.00; 40-lb. coating, I. C., $23.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Relined iron bars, 3.50c. common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots, the Pittsburgh basing card.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	26	7
½	51	36½	⅜	27	12
¾ to 3	54	40½	½	31	16
			¾ to 1½	36	23

Lap Weld

2	47	34½	1¼	21	3
2½ to 6	50	37½	1½	24	6
7 to 12	47	33½	2	29	13
13 and 14	37½	..	2½ to 6	31	16
15	35	..	7 to 12	28	13

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	⅛, ¼ and ⅜	25	3
½	48	35½	½	30	12
¾ to 1½	52	39½	¾ to 1½	36	23
2 to 3	53	40½			

Lap Weld, extra strong, plain ends

2	45	33½	1¼	22	3
2½ to 4	48	36½	1½	28	6
4½ to 6	47	35½	2	30	13
7 to 8	43	29½	2½ to 4	32	16
9 to 12	38	24½	4½ to 6	31	16
			7 to 8	23	8
			9 to 12	18	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	37	3½ to 4½ in.	12
2½ to 3¼ in.	27	3 to 3¼ in.	+7
2¼ in.	20½	2½ to 2¾ in.	+4
1¾ to 2 in.	16	2 to 2½ in.	+10
		1¾ to 1⅞ in.	+22

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$334	1¾ in.	1
1¼ in.	274	2 to 2½ in.	1
1⅜ in.	264	2¾ to 3¾ in.	1
1½ in.	214	4 in.	1
		4½ to 5 in.	2

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

	Cents per lb.
Blue Annealed—Bessemer	
No. 8 and heavier	3.85
Nos. 9 and 10 (base)	3.90
Nos. 11 and 12	3.95
Nos. 13 and 14	4.00
Nos. 15 and 16	4.10
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.70
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28 (base)	5.00
No. 29	5.10
No. 30	5.30
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.05
Nos. 12 and 14	5.15
Nos. 15 and 16	5.20
Nos. 17 to 21	5.45
Nos. 22 and 24	5.60
Nos. 25 and 26	5.65
No. 27	5.80
No. 28 (base)	6.05
No. 29	6.20
No. 30	6.55
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.50
Nos. 17 to 21	4.55
Nos. 22 to 24	4.60
Nos. 25 and 27	4.65
No. 28 (base)	4.70
No. 29	4.75
No. 30	4.75
Nos. 30½ and 31	4.80

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

Copper, New York		Tin,	Lead		Spelter	
Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
....	....	....	...	...	...	...
18.25	17.75	72.50	5.00	4.70	6.80	6.45
18.00	17.50	72.50	5.00	4.70	6.75	6.40
17.75	17.25	....	5.00	4.70	6.75	6.40
17.50	17.00	72.50	5.00	4.70	6.70	6.35
17.50	17.00	72.50	5.00	4.70	6.70	6.35

NEW YORK, Feb. 19.

The markets are all extremely quiet, with consumers maintaining a waiting policy. Copper continues to decline, but on small sales. The tin market is stagnant. Lead is quiet but firm. Spelter is also very quiet but steady. Antimony is unchanged.

New York

Copper.—On sales of small lots, principally by small producers and dealers and in some cases on speculation, electrolytic copper has declined almost daily in the past week to 17c., New York, for early delivery. Large producers are said to be still quoting higher, but the business done has not been of sufficient volume to interest them. Lake copper is nominally lower, at 17.50c., New York, for early delivery. It is reported that the electrolytic quotation could be shaded. Production continues to be generally curtailed.

Tin.—The market continues stagnant and without feature. Straits tin is still nominal at 72.50c., New York, with 99 per cent American tin being offered at 72c. per lb. It is understood that the War Trade Board has been refusing all licenses for imports of Bolivian concentrates and ores into this country. This will tend in time to greatly assist in the liquidation of the stocks of Government allocated metal. In the meantime, buying for future shipment is impossible, though reports are to the effect that Straits tin can be bought for shipment from the Far East at less than 47c., which contrasts with the fixed price for allocated metal of 72.50c.

Lead.—A fairly widespread inquiry for small lots has been received from consumers in the past week. A moderate amount of business has been closed at or near 5c. A good deal of the business is being taken by the American Smelting and Refining Co., whose price is still 5c., New York. Some of the independent producers are not anxious to sell at this price, but a few sales are reported at about $1 a ton under 5c. Such sales, however, have not been sufficient in number nor of sufficient volume to establish a market price on that basis. Curtailment of production continues. Sellers feel that the bottom has been reached, and some predict that the leading interest will soon increase its price at least one quarter of a cent.

Old Metals.—The market continues very quiet. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	18.00
Copper, heavy and wire	17.00
Copper, light and bottoms	14.00
Brass, heavy	12.00
Brass, light	9.50
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	10.00
No. 1 red brass or composition turnings	15.00
Lead, heavy	4.50
Lead, tea	3.25
Zinc	5.25

Spelter.—Firmness with lack of demand characterizes the spelter market. Consumers are manifesting very little interest, and producers are apparently by no means eager to sell, many claiming that the present levels are under cost of production. Prime Western for early delivery is quoted at 6.35c., St. Louis, or 6.70c., New York, and largely nominal. The improved inquiry noted a week ago has fallen off.

Antimony.—The market is dull, with quotations nominal at 7.12½c. to 7.25c., duty paid, New York, for wholesale lots.

Aluminum.—The outside market, so called because not influenced by the maximum quotations effective until March 1, is quoted at 31c. to 32c. per lb. for No. 1 virgin metal as compared with the maximum price of 33c. per lb. in 50-ton lots.

St. Louis

FEB. 17.—Non-ferrous metals continue dull with the price tendency lower, lead in car lots closing at 4.65c. and spelters, 6.40c. In less than car lots quotations are: Lead, 5.25c.; spelter, 7c. to 7.25c.; tin, 72.50c.; copper, 20c.; Asiatic antimony, 8.50c. In the Joplin district the depression continues in ores with the demand for zinc blende restricted and a number of mines reported shut down. Lead has been also featureless and prices held low, while calamine has been dull and at a lower range. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7c.; heavy yellow brass, 10c.; heavy red brass, 14.50c.; heavy copper and copperwire, 15c.; light copper, 14c.; pewter, 40c.; tinfoil, 45c.; zinc, 3.50c.; lead, 4c.; tea lead, 4c.; aluminum, 20c.

Chicago

FEB. 18.—Buying for future delivery continues a minus quantity but in spot transactions the market shows a little betterment. Copper consumers have been forced into the market by their needs. In tin there has been a fair small-lot activity. Lead and spelter have been more active the past two or three days than in many weeks. Antimony is extremely quiet. We quote copper at 19c. to 20c. for carloads; tin, 72.50c.; lead, 4.90c. to 5c.; spelter, 6.50c.; antimony, 8.50c. to 9c. On old metals we quote copper wire, crucible shapes, 13.50c.; copper clips, 13c.; copper bottoms, 11.50c.; red brass, 13.50c.; yellow brass, 8.50c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 30c.; tinfoil, 35c.; and block tin, 45c.

New Base Prices on Brass and Bronze

For the first time since the withdrawal of list prices for brass products shortly after the start of the European War, the American Brass Co. has issued a new list of base prices, effective from Feb. 11. These are for mill shipment only, and are subject to additions for extras as per lists printed in the company's price book or price list No. 12, and from such extras 25 per cent discount will be allowed, except on brazed tubes on which extras are net list. The prices are subject to change without notice, and cancel all previous lists.

Base Prices of Brass and Bronze Products Effective Feb. 11

SHEET METAL

	Cents per Lb.
High Brass	22¾
Low Brass	24¾
Rich Low Brass	25¾
Commercial Bronze	26¾
Common Gilding	26¾
Extra Spring Drawing and Spinning Brass	23¾
Best Spring Drawing and Spinning Brass	24¼

WIRE

High Brass	22¾
Low Brass	24¾
Commercial Bronze and Gilding	26¾
Extra Spring and Brazing Brass	23¾
Best Spring and Brazing Brass	24¼

RODS

High Brass	21¾
Low Brass	25½
Commercial Bronze	27¾

BRAZED TUBES

Brass	32¾
Copper and Commercial Bronze	37¼
Open Seam Brass	32¾
Open Seam Copper and Commercial Bronze	37¼

ANGLES AND CHANNELS

Special Prices Quoted Upon Application

SCRAP ALLOWANCES

High Brass	12
Low Brass	13
Commercial Bronze and Gilding	14½

OBITUARY

Howard P. Eells

HOWARD P. EELLS, Cleveland, for 15 years prominently identified with the National Metal Trades Association, of which he was president from 1909 to 1911, and closely affiliated with various industrial enterprises in the Central West, died, aged 63, at Pasadena, Cal., Feb. 11. He had not fully recovered from an automobile accident nearly two years ago, but had been at his office up to the day of his departure for California a few days before his death. Mr. Eells was born in Cleveland and graduated from Hamilton College in 1876, and from Harvard University in 1877. For many years he was president of the Bucyrus Co., South Milwaukee, Wis., manufacturer of excavating machinery, and at the time of his death was chairman of the board of that company. Previous to the holding of the presidency of the National Metal Trades Association, he served for some time as treasurer and as one of the councillors of that association. He was president of the Dolomite Co., Cleveland, director of the Sandusky Cement Co., Sandusky, Ohio, and director and member of the executive committee of the Superior Savings & Trust Co., Cleveland. He was also very active in other organizations and a member of the leading clubs of Cleveland. He is survived by his wife, three sons, Dan P. Eells, treasurer of the Bucyrus Co., Howard P. Eells, Jr., and Samuel Eells, lieutenants in the 42nd Division (Rainbow Division), now in France, and four daughters.

H. P. EELLS

DAVID O. HOLBROOK, aged 47, a recognized authority on natural gas, died at his home on the North Side, Pittsburgh, Saturday evening, Feb. 15. Although death was caused directly by an attack of acute indigestion, Mr. Holbrook had impaired his health by overwork connected with his war duties as head of the Division of Natural Gas in the United States Fuel Administration. He was secretary and treasurer of the American Natural Gas Association, president of the Natural Gas Supply Men's Association, and vice-president of the Dayton Pipe Coupling Co. He had been connected previously with the Oliver & Snyder Steel Co. and the Pennsylvania Malleable Co. He was born in Iowa and attended the University of Iowa. In 1893, he went to Pittsburgh.

HARRY DEMEREST TOWNSEND, who died recently, aged 44, was electrical engineer for the Dominion Iron & Steel Corporation, Sydney, N. S. Mr. Townsend had been engaged with electrical work of various kinds in iron and steel plants for more than 20 years. He first started work in this line at the Ohio works of what was then known as the National Steel Co. at Youngstown, Ohio, now owned and operated by the Carnegie Steel Co. Afterward he became assistant electrical engineer at the Lorain, Ohio, works of the National Tube Co., and in November, 1918, was appointed electrical engineer of the Dominion Iron & Steel Corporation. His death was due to pneumonia, after an illness of one week.

JOSEPH W. MOON, president Moon Motor Car Co. and Joseph W. Moon Buggy Co., both of St. Louis, and vice-president Schleter Implement Co. of Moline, Ill., died at his home in St. Louis Feb. 13 after an illness of a year, aged 68. When the United States entered the war, the plant of the Moon Motor Car Co. immediately turned exclusively to the manufacture of [illegible] mm. shells. The company is said to have held Government contracts amounting to $5,000,000 when the armistice was declared.

PHILLIP H. WYNNE died at Deerfield, Mass., on Feb. 11, after a lingering illness. Born in 1868 and educated at the Massachusetts Institute of Technology, he secured employment at Chicago with the Illinois Steel Co. Later returning East he was successively with the Thomson Houston Electric Co., and the Boston Elevated Railway, leaving the latter to enter the business of making various scientific apparatus. He was the inventor of an ore separator used in mines, and did much fine work on such instruments as galvanometers.

CHARLES H. SPANG, a member of the firm of Spang, Chalfant & Co., Inc., Pittsburgh, manufacturers of wrought iron pipe, died at the Waldorf-Astoria hotel, New York, Saturday night, Feb. 15. Mr. Spang was 70 years of age, and for 15 years had made his home at that hotel. He had long been ill and his death was not unexpected. He is survived by his wife and one married daughter. Mr. Spang had not been active in the affairs of Spang, Chalfant & Co. for more than 20 years.

FREDERICK L. HICKOK, president of the Reliance Gauge Column Co., Cleveland, O., died Feb. 16 of pneumonia after a week's illness, aged 36 years. He was a graduate of Case School of Applied Science and was connected with the Ingersoll Milling Machine Co., Rockford, Ill., for five years and later was associate editor of *Machinery*. He severed his connections with that publication about a year ago to become connected with the Reliance company.

WILLIAM W. HAYWARD, Cleveland, who was connected with the Cleveland City Forge & Iron Co. for about 25 years, being treasurer for a long time, died Feb. 12 of pneumonia, aged 62 years. Recently he had been secretary-treasurer Butler Drawbar Attachment Co., Cleveland.

CARL SCHMIDT, for the past year and a half in the sales department of the Stocker-Rumely-Wach's Co., Chicago, and for many years with Manning, Maxwell & Moore, died from pneumonia Feb. 14, aged 35 years, after a short illness.

A. M. CRANE, formerly general manager of sales for the Illinois Steel Co. and the Federal Steel Co. before the formation of the United States Steel Corporation, died Feb. 10 at his home in Chicago. For several years he had not been connected with the steel industry.

WILLIAM G. WILLARD, president Eureka Steel Rail Co., O'Fallon, Ill., died at his home in that city last week. He was 66 years old.

GEORGE J. KELLOGG, secretary-treasurer Commerce Motor Truck Co., Detroit, for the last seven years, died in Grace Hospital, Detroit, Feb. 9, following an operation. Mr. Kellogg had lived in Detroit for 30 years.

Announcement is made of the formation by F. [illegible] Horne of a Japanese corporation known as Horne Co., Ltd., succeeding the old established business of F. [illegible] Horne & Co. The new corporation of Horne Co., Ltd., has been purchased from Mr. Horne by the American International Corporation, New York, which will continue the business along its present lines and under the new name of Horne Co., Ltd.

The American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa., has contracted with the French Government for electric steel sheets, aggregating about $1,000,000 in value, and is said to be planning for the immediate operation of its works for production. The order is estimated to require about two months' capacity operation.

The Sperry Gyroscope Co., Brooklyn, has applied to the Federal Trade Commission for the use of [illegible] alleged enemy patents covering the manufacture of gyroscopic apparatus. The commission is considering the merits of the application.

THE MINING ENGINEERS

Annual New York Meeting Featured by Striking Papers and Large Attendance

The largest registration in the history of the American Institute of Mining Engineers attended its 119th meeting in New York this week, Feb. 17-19. This year records the first annual meeting in which the Institute of Metals held a simultaneous session since its incorporation with the institute.

As usual the sessions of the iron and steel section occupied a commanding interest. These were held on the morning and afternoon of Tuesday, and covered an unusual variety in subjects, including particularly the structure of nickel steel gun forgings, certain phases of cast high-speed steel tools and important papers on metallography. They were presented in most cases by the authors, which was a feature.

Wednesday morning was devoted to a session of the National Research Council, at which various phases of the manganese problem and a report of the steel ingot committee were prominent subjects. Wednesday afternoon was taken up by a joint session of the American Institute of Electrical Engineers, the subject being electric welding. The session devoted to the Institute of Metals occupied the attention on Monday.

An unusual feature of this year's convention was the setting aside of Feb. 18 as Canadian Mining Institute day. Prominent members of the Canadian institute were present and took part in joint discussions with the American institute on various mining problems, the sessions being simultaneous with those of the iron and steel section.

Horace V. Winchell of Minneapolis was elected president for the ensuing year. He is an eminent geologist of Minneapolis, Minn., whose early work led to the discovery of the Mesaba iron ore range. He is joint author with Prof. N. H. Winchell of "The Iron Ores of Minnesota." A. R. Ledoux and Edward Ledoux were elected as directors and vice-presidents, the former being newly elected. Three new directors were chosen in Stanley A. Easton, Louis S. Cates and J. V. W. Reynders who, with C. F. Rand and G. D. Barron, re-elected, constitute the rest of the board.

By a majority vote the institute will hereafter be known as the American Institute of Mining and Metallurgical Engineers.

New Fabricated Steel Contracts Scarce

The bridge and structural shops of the country took contracts in January for only 21,600 net tons of steel work, amounting to but 12 per cent of the entire shop capacity, according to the records of the Bridge Builders and Structural Society, 50 Church Street, New York, collected by George E. Gifford, its secretary. This is the greatest stagnation ever met with in steel fabricating lines since general records have been kept. The nearest approach was in November, 1914, when only 20 per cent of capacity was contracted for. How far the activity the past month falls short of the war years is shown by the fact that January contracts in 1915 were 25 per cent of shop capacity; in 1916, 69 per cent; in 1917, 61½ per cent, and in 1918, 53 per cent.

Blast Furnace Improvements

YOUNGSTOWN, OHIO, Feb. 18.—Included in the program of furnace improvements mapped out by the Carnegie Steel Co. is the relining and overhauling of each of the six blast furnaces at the Ohio works. No. 1 is to be suspended in April, and as fast as one is relined and repaired another is to be blown out for the same purpose.

The Brier Hill Steel Co. is planning to overhaul two of its three furnaces at the Brier Hill works, starting in the spring. Grace furnace has been in continuous operation for five and one-half years. Jeannette furnace, the third in the battery, was started several months ago and is now producing at capacity. It is rated as a 500-ton stack.

The Youngstown Sheet & Tube Co. will also repair, commencing in the spring, its furnaces at East Youngstown. No. 1 stack at Hubbard, Trumbull county, will be blown in about Feb. 1, after being overhauled and converted from a hand-filled to a mechanical filled stack.

The Republic Iron & Steel Co. has suspended Atlantic furnace at New Castle, Pa., and Hall furnace at Sharon, Pa. indefinitely because business does not justify their operation. No. 2 furnace at Haselton is now being overhauled and mechanical apparatus for filling is being installed.

President Wilson Requested to Call Conference on Labor Conditions

The following resolution was adopted at the meeting of the New York Business Publishers' Association, Inc., Monday evening, Feb. 17, to be presented to President Wilson as soon as possible after his return to the United States:

Whereas, Through all allied countries, workers of all kinds whether representing capital, labor or Government, rose in the defense of the ideals of liberty and world peace, counting no price too great for their protection; and,

Whereas, At the present time there is grave danger that the benefits of our great victory for these ideals may be wholly nullified by the dissensions and misunderstandings between capital and labor; and,

Whereas, The President of the United States has at this time the attentive ear of the peoples of all civilized countries, and every public utterance of his is now carefully and critically read everywhere; now be it

Resolved, That we, the members of the New York Business Publishers' Association, Inc., publishers and editors of business papers, desiring only that the benefits of peace may come to the employers and employees in all trades and industries, do hereby respectfully request and urge you to promptly issue a message to labor, capital and statesmen, setting forth the dangers if the present world conditions continue, and that you promptly issue a call for a national conference of representatives of labor, capital and the Government, to the end that industrial peace, so vital to our national welfare, may be speedily restored.

Shovel Manufacturers Organize

As a result of several meetings held recently, shovel manufacturers throughout the country, with the exception of one or two, have formed an organization to be known as the American Shovel Institute. George S. Phillips, Pittsburgh Shovel Co., has been elected president, and George D. McIlvain, secretary. It is stated the new organization has been formed for the purpose of correcting some abuses that have crept into the shovel industry, and also to take care of matters that may come up from time to time affecting the shovel trade. It is said no attempt will be made to control prices. The headquarters of the association are in the H. W. Oliver Building, Pittsburgh.

New Chain Works at Harrisburg, Pa.

The United States Chain & Forging Co., recently organized, and with general offices in the Union Arcade, Pittsburgh, has decided to locate its new welded chain plant at Harrisburg, Pa. It is the intention of the company to build a plant to make chain of all sizes up to and including ½ in., to consist of track, Liberty coil, halter, machine, harness, coil and chandelier chain. Contracts for buildings and equipment are expected to be placed this week, and it is hoped to have the plant in operation in about four months, possibly in July or early August. It is said that eventually this plant will employ upwards of 1000 men.

At the Ferguson Steel & Iron Works shipyards on the Buffalo River, at Abbott Road, Buffalo, Feb. 17, the first tug of the 24 it has under contract for the United States Government was launched. Mrs. James E. Ferguson, wife of Capt. James E. Ferguson, president of the company, was sponsor.

Machinery Markets and News of the Works

AUTOMOBILE TRADE BUYS

General Motors Corporation Issues Large List

About Fifty Tools Wanted by Syracuse, N. Y., Company—Export Trade Prospects

Among inquiries being received by machine-tool builders, the most promising are those from automobile and tractor manufacturers, as orders are being placed promptly after receipt of quotations, whereas users of tools in nearly every other line show hesitancy in buying at present high prices.

The General Motors Corporation has issued a large list of equipment for a new plant in Detroit to manufacture automobile differentials. This interest is also sending out inquiries for a large quantity of equipment for the Samson tractor plant at Janesville, Wis. Most of this will probably be placed in the Central West.

Cleveland machine-tool builders and dealers report that demand is almost wholly from the automobile and tractor industries, while the Cincinnati trade reports an improving demand for machine tools from the same sources.

In Chicago the aggregate business is fairly satisfactory, there having been such a lively demand for milling machines that a Milwaukee builder has been obliged to put on a night shift.

The principal inquiry in the East during the past week has come from the New Process Gear Corporation, Syracuse, N. Y., which wants about 50 tools for automobile gear work.

Plans are under way for the construction of about 20 large dry docks and ship repair plants along the Atlantic Coast to take care of the increasing American merchant marine. Private companies are being encouraged financially by the United States Shipping Board to undertake the construction of these plants, and in at least two instances sufficient progress has been made to bring out inquiries for shop equipment. If all of the proposed dry docks are built a considerable quantity of equipment business will develop.

Taking the country as a whole, domestic business in machine tools is showing improvement. The export situation has many promising features, but actual business is not developing as rapidly as has been hoped for. One of the most important export inquiries before the trade is from the Standard Oil Co. of New Jersey, which wants between 60 and 70 machines for shipment to Rumania. Two separate lists have been sent out, one covering equipment for a tank shop and the other for a machine shop, the latter list having been mentioned in this column last week.

Two inquiries from Belgium have been received by Cleveland machine-tool builders, aggregating 30 to 40 tools. In both cases the equipment desired is to replace that destroyed or carried away by the Germans.

There are conflicting reports as to the possibilities of export business with France. One report is that a French syndicate of manufacturers will buy several million dollars worth of equipment, while an entirely opposite view is held in some quarters that very little, if any, business will come from France, at least not for some time.

American machine-tool builders have been disturbed by reports from the other side that a selling organization of British machine-tool builders, comprising about a dozen companies, has been approaching distributers in Holland and other European countries with offers of exclusive agency rights if no American tools are sold. There are reports also that the British embargo on tools, effective March 1, will remain in force at least a year, but on the other hand, some tool builders have received information that the license system will be sufficiently elastic to permit the importation of tools that are actually required by British manufacturers.

Prices on punching, shearing and allied machinery have been reduced from 10 to 15 per cent by a Cleveland builder.

New York

NEW YORK, Feb. 18.

The principal domestic inquiry for machine tools of the past week came from the New Process Gear Corporation, Syracuse, N. Y., which wants about 50 miscellaneous tools for gear work. The list includes 8 Gould & Eberhardt shapers, 2 Avey drilling machines 3 Bullard multip'e vertical turret lathes, 10 Gleason spiral pinion roughers, 3 Lucas presses, 7 Hendey engine lathes, 1 Landis plain grinder, 4 tapping drills, 2 broaching machines, 6 milling machines, and other single tools and attachments.

The largest export inquiry before the trade which shows signs of being closed at an early date is that of the Standard Oil Co. of New Jersey for shipment to the Rumanian oil fields. In addition to the list of machine tools mentioned last week, about 40 in number, an additional list was sent out covering machines for a tank shop. This latter list includes a straightening roll, a plate planer, a 60-in. radial drill, a 36-in. plate punch, 3 30-in. plate punches, a 12-in. vertical punch for angles and a 12-in. horizontal beam punch, a shear, pneumatic riveter, electric welding apparatus, a metal cutting-off saw, wall-type radial drills, a 66 in. cylinder-boring machine, a 72-in. universal radial drilling machine, a single-spindle drill press a 52-in., a 24-in., a 32-in. and a 60-in. vertical drilling machines, a heavy-duty milling machine. This makes a total of from 60 to 70 machines that the Standard Oil Co. will probably buy.

Brewster & Co., Long Island City, N. Y., have asked for a great many quotations on machine tools, but it is intimated in some quarters that these quotations are for appraisal purposes only.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is buying equipment at its office in the Woolworth Building, New York, for its new boiler shop to be built at Richmond, Va. Some of the orders placed several months ago, when the project was first taken up, are being reinstated, but on a part of the equipment new bids are being obtained. The Cleveland Crane & Engineering Co., Cleveland, has received a reinstatement of an order for 11 cranes for this shop, but new orders will be given for much of the plate-working machinery.

Large purchases of machinery are expected to result from the construction of a score or more of large drydocks along the Atlantic Coast. The United States Shipping Board is promoting the organization of private companies to build these drydocks, with complete ship repair shops, and two companies, one at Norfolk, Va., and another at Baltimore, Md., have practically completed their organization and will soon be inquiring for equipment. Other projects are said to be still in the formative stage. Reports are that 10 drydocks will be built at or near New York, five at Boston

others will be at Philadelphia, Baltimore and Norfolk. one under way at the latter port is the Norfolk-Hampoads Ship Repair Corporation, to which reference was e in this column two weeks ago.

Crane inquiry is very light, the only prospective purchase importance now before the trade being the inquiry of the erican Locomotive Co. for two 50-ton cranes, one for Schenectady works and one for its Brooks works. The y Department will issue specifications shortly for about large cranes for the United States Naval Defense Plant Charleston, W. Va., commonly called the armor plate nt.

There are quite a number of export prospects, but most them are rather indefinite. Financial arrangements must completed in most cases before actual purchases can be e. In this connection the trade notes with interest that Belgian loan of $50,000,000 has been arranged by New k bankers, and a representative of French interests is reed to have reached New York to arrange for a loan of ut $100,000,000 to $200,000,000. In all probability some these funds will be expended for machine-tool equipment. re are conflicting reports, however, in the machine-tool de as to the extent of the purchases which France and gium will make here. Some have it on apparently good thority that France will buy little or nothing here in machinery line, at least for some time to come, while ther report is that a syndicate of French manufacturers l buy very soon equipment amounting to millions of lars.

It is pointed out that there are in France large stocks tools owned by the United States Government which e shipped there for war purposes, and that all of these l be disposed of at bargain prices, and these sales are pected to have a somewhat discouraging effect upon purses of new tools from American builders.

Disquieting reports from the other side have been reed by American machine-tool builders as to the methods taken by a selling organization of British machine- manufacturers, who are reported to have approached panies in Holland and other countries with proposals they will be given exclusive selling rights for the ish organization if they do not handle American tools. smacks so much of the methods employed by German ests before the war that American selling companies become somewhat alarmed. Reports that the British argo on machine tools may remain in force for a year, ther with other unfavorable features in the European ation, have produced a feeling of pessimism in some ers as to the development of a European demand for ican tools.

The Reading Steel Castings Co., Reading, Pa., is getting ations on a list of tools for a machine shop which it build.

Frank A. Vanderslip, 7 Wall Street, New York, president d of managers, Letchworth Village, Thiels, N. Y., will ask for bids for a power-house extension and addil power equipment, plans for which have been prepared Lewis F. Pilcher, State architect, Capitol, Albany. The ated cost is $300,000.

The Hudson Power Corporation, care Kingston Gas & ric Co., Kingston, N. Y., has had plans drawn by the . White Engineering Corporation, 43 Exchange Place, York, for a power plant to be built on the Walkill River ew Rifton, N. Y.

The New Rochelle Machine & Repair Co., New Rochelle, has been incorporated by M. A. Loftus, C. S. Shaffer M. Smith, 253 Broadway, New York.

The American Cyanamid Co., 511 Fifth Avenue, New has had plans prepared for two additional one-story ge, 100 x 180 ft. and 50 x 120 ft., of steel frame and ated iron, to be erected at its plant on the Canadian r Niagara Falls. It is stated the total cost of the will be $4,500,000.

The Commercial Repair Co., New York, has acquired a tory building at 314-18 East Twenty-eighth Street for chine repair shop and general service station.

The Geer-Hill Co., New York, has been incorporated with ital of $10,000 by E. H. Brill, W. J. McCurdy and P. er, 149 Broadway, to manufacture machinery.

The Efficiency Device Corporation, New York, has been rated with a capital of $10,000 by H. A. Tremaine, Vivarttas and C. R. Tock, Flushing, Long Island, to facture machine shop and foundry equipment and sup-

The Special Bolt Machinery Corporation, New York, has rganized by J. A. Eden, Jr., W. H. Foster and S. son, 588 Seventy-fifth Street, Brooklyn, to manufacture hery and operate a general machine works.

Charles Miller, 534 Grand Street, Brooklyn, has had plans prepared for a one-story forge and blacksmith shop, 50 x 75 ft., at 964 Grand Street.

The Hamblin Tool Mfg. Co., New York, has been incorporated in Delaware with capital of $500,000 by P. D. Benson, W. Metkeff and F. B. Knowlton, New York.

The Cameron Machine Co., 61 Poplar Street, Brooklyn, manufacturer of rolling and cutting machinery, has filed plans for a new one-story machine shop to cost about $20,000.

The McKiernan-Terry Drill Co., Richards Avenue, Dover, N. J., manufacturer of mine drills, etc., is reducing its force of machinists.

The Power Machinery Exchange, Jersey City, has been incorporated with a capital of $25,000 by D. J. Dowling, C. S. Ashley and E. C. Randall.

The William E. Drislane Co., 40-42 North Pearl Street, Albany, has had plans prepared for a 11-story light manufacturing and office building to be erected on North Pearl Street of brick and stone construction.

The Springwater Electric Light Co., Springwater, N. Y., has petitioned the New York State Public Service Commission, Albany, for permission to construct an electric light plant at Springwater.

The International Motor Co., Plainfield, N. J., has eliminated overtime and reduced the night force. It is now giving employment to about 1600 persons.

The Lock Joint Pipe Co., East Orange, N. J., has filed plans for a one-story shop extension on North Grove Street.

The Atlantic Automatic Sprinkler Corporation, New York, has been incorporated with a capital of $20,000 by F. L. Driscoll, E. F. Shipman and W. H. Brady, 141 Broadway, to manufacture sprinklers.

The American Die & Tool Works, 182 Centre Street, New York, is having plans prepared for a two-story plant, 50 x 90 ft., at Woodhaven, Long Island, to cost $25,000.

The Ackerman Brothers Co., New York, has been incorporated with a capital of $25,000 by E. L. Weiler, H. McInnes and R. G. Ackerman, 95 Liberty Street, to manufacture mill and railroad equipment and supplies.

The Municipal Auto Garage & Machine Corporation, 26 Court Street, Brooklyn, has filed plans for a new one-story machine shop, 75 x 200 ft., on Sixtieth Street, near Fort Hamilton Parkway, to cost $35,000.

The Metal-I-Let Mfg. Co., New York, has been incorporated with a capital of $50,000 by F. W. Suydam, G. A. Walker and E. P. Gaillard, 220 West Fifty-eighth Street, to manufacture metal tags.

The Houpert Machine Co., 351 West Fifty-second Street, New York, has increased its capital from $100,000 to $500,000. H. J. Houpert is president.

The Atlantic Container Products Corporation, New York, has been incorporated with a capital of $82,500 by W. E. Turner, A. M. Van Wagenen and H. T. Von Frankenberg, 1765 Broadway, to manufacture containers and receptacles.

The White Co., Park Avenue and Fifty-seventh Street, New York, is having preliminary plans prepared for its new automobile service plant to be located at Thompson and Nott avenues, School and Mount streets, Long Island City. The structure will be 1½ stories, brick and reinforced-concrete, providing about 120,000 sq. ft. of floor area. It will be equipped for machine work, assembling and repair operations, etc.

The Brooklyn Commercial Body Co., Avenue H and East Thirty-fifth Street, Brooklyn, manufacturer of automobile bodies, etc., has increased its capital to $20,000.

The Studebaker Corporation, 1751 Broadway, New York, has leased a six-story steel and concrete building at 217-223 West Seventy-seventh Street, recently completed, for a new assembling, repair and automobile service works. It has subleased its recently constructed building on Anable Avenue, Long Island City, originally designed for its assembling and service plant, to the National Casket Co., which will occupy it. It has been decided to locate the new works in a more convenient district, as provided by the New York location as now arranged. The term of occupancy covers a period of 21 years.

The Gourland Typewriter Corporation, New York, has been incorporated with a capital of $2,000,000 by M. Zan, G. R. Smith and L. Mitchell Henry, 37 Madison Avenue, to manufacture typewriters.

Officials of the General Motors Corporation, Broadway and Fifty-seventh Street, New York, have incorporated the General Motors Acceptance Corporation, with operating capital of $2,500,000, as a subsidiary organization. The company is designed to handle the financial end of the business, covering the needs of works and factories, as well as affiliated interests of the parent corporation. J. A. Haskell

is president, and Paul Fitzpatrick, vice-president and general manager.

The American Steel Goods Co., New York, has been incorporated in Delaware with a capital of $20,000 by Paul S. Smith, Samuel B. Howard and Arthur W. Britton, 28 Nassau Street, to manufacture tools, boiler equipment, etc.

The Atlantic Basin Iron Works, Summit Avenue, Brooklyn, will build a one-story addition to its plant at Imlay and Browne streets, to be used as a forge shop. It is estimated to cost $45,000.

The New York State Legislature, Albany, N. Y., is considering an appropriation of $230,000 for the erection of three machine shops for repair and other work in connection with the State Barge Canal. The shops would be provided with machinery and apparatus to handle repairs of operating equipment, etc. W. W. Wotherspoon, Superintendent of Public Works, is in charge.

Corning & Co., Inc., Colonie, N. Y., has been incorporated with a capital of $1,100,000 by H. G. Batcheller, P. and E. Corning, to manufacture metal alloys.

The Aeromarine Plane & Motor Co., Keyport, N. J., has resumed operations on a pre-war basis, and is now reducing its working force. Construction work has been held up for the present on the proposed machine shop to be occupied by the New Jersey Motor Sales Co. for the manufacture of motor boats, etc., in association with the Aeromarine Plane & Motor Co., it being planned to use this company's motor for the operation of the boats. It is understood that the construction of the building to be one-story, about 60 x 100 ft., may be resumed at an early date. O. C. Linthwaite is interested in both enterprises.

With the return of a number of the industrial works at Rockaway, N. J., to a pre-war basis of operation, a curtailment has been made in regular time schedule by the adoption of a three-day per week schedule. Among the plants now operating on this plan are the International High Speed Steel Co. and the Rockaway Rolling Mills. It is expected to return to a full-week time basis as soon as call for production warrants.

The Fred Wolff Millwrighting & Hardware Co., East Orange, N. J., has been incorporated with a capital of $50,000 by C. O. Geyer, N. M. Picking and E. R. Coburn.

The Hayden Invention Corporation, Westfield, N. J., has been incorporated with a capital of $10,000 by J. M. Hayden, I. H. and Roger Mason, to manufacture special machinery.

The Everlasting Valve Co., Westside Avenue, Jersey City, N. J., has acquired the property of the Spiral Riveted Pipe Co. in the Bergen district, consisting of plant and site, 120 x 1000 ft. It is understood that the new owner plans for the occupancy of the plant to provide increased manufacture of valves and other specialties.

The machinery and stock of the Drop Forging Co., Westside Avenue and Fiske Street, Jersey City, N. J., were recently damaged by fire.

Fire, Feb. 6, destroyed the forge and blacksmith shop of the Ardmear Trucking Co., East Forty-first Street, Bayonne, N. J. John Fitzmaurice is president.

The National Welding Co., 80 Dickerson Street, Newark, N. J., has filed plans for a one-story addition, 50 x 65 ft.

The New Jersey Cutlery Co., Newark, N. J., has been incorporated with a capital of $100,000 by Robert Levy and Jacob Friedman, Newark, and Leon Brach, East Orange, to manufacture cutlery.

The William J. Rainaud Lamp Co., 121-23 Lafayette Street, Newark, N. J., has filed notice of organization to manufacture lamps. William J. Rainaud, 308 Lafayette Street, heads the company.

The Board of Education, Newark, N. J., will soon call for bids for the erection of the proposed new vocational high school on Sussex Avenue. The structure will be three and four-story, brick and reinforced-concrete, 170 x 225 ft., and is estimated to cost $500,000. A complete shop for vocational training will be installed, including machine shop, forge shop, electrical shop and other mechanical departments. John H. and Wilson C. Ely, Firemen's Building, are architects.

The Public Service Corporation, Newark, N. J., has increased its capital from $50,000,000 to $100,000,000. A portion of the increase will be arranged for issuance at the present time, including notes to the amount of $12,500,000 and preferred stock for $10,000,000, the proceeds to be used in part for extensions and betterments to the electric plants and system.

The plant and property of the Newark Bay Smelting & Refining Co., Plum Point Lane, Newark, N. J., will be sold at a receiver's sale. The site consists of plant buildings on about 13 acres of land, with works including machinery, tools, metal smelting and refining equipment.

The property of A. W. Faber, Dickerson and Hecker streets, Newark, N. J., manufacturer of rubber products, pencils, etc., will be sold by A. Mitchell Palmer, alien property custodian, Feb. 27.

The improvement work to be undertaken by M. R. Everett, Newark, N. J., at his iron works and fabricating plant on Avenue D will consist of rebuilding of the structure recently damaged by fire. The work will cost about $8,500.

The National Casket Co., 14 East Thirty-ninth Street, New York, is having plans prepared for extensions and improvements in its five-story plant on Jackson Avenue, Long Island City, to cost about $20,000.

The American Wire Rope Syndicate, New York, has been incorporated with a capital of $25,000 by A. Brodigan, A. Brunn and P. Paulsen, 109 Broad Street, to manufacture wire rope, etc.

The O. & J. Machine Sales Co., New York, has been incorporated with a capital of $25,000 by J. B. Wickery, T. A. Oliver and F. W. Muller, 1476 Broadway.

The Standard Cinema Machinery Mfg. Corporation, New York, has been incorporated with a capital of $100,000 by E. B. Field, T. Rosenwasser and B. H. Freedman, 340 West Eighty-sixth Street, to manufacture motion picture machinery.

B. Littauer, 100 Fifth Avenue, New York, has filed articles of incorporation under the name of B. Littauer, Inc., with a capital of $10,000 to manufacture surgical instruments.

The Liberty Starters Corporation, 200 Fifth Avenue, New York, manufacturer of automobile starting equipment, etc., has broken ground for a one-story plant, 60 x 200 ft., at Poughkeepsie, N. Y., to cost about $50,000.

The Wern Rotator Co., New York, has been incorporated with a capital of $50,000 by G. P. and W. C. Wern, 96 Hamilton Place, and H. C. Prout, 92 Oxford Avenue, Richmond Hill, to manufacture rotator equipment for hoisting and rigging machinery.

The Norman Foundry Co., Brooklyn, has been incorporated with a capital of $15,000 by J. and G. Miller and B. Zwerin, 856 Griggs Avenue.

Fire, Feb. 6, destroyed a portion of the Government naval air station at Rockaway Point, Long Island, with loss estimated at over $100,000, including garage and motor truck repair department.

The Plunkett Shock Absorber Co., Brooklyn, manufacturer of front shock absorbers for automobiles, is planning to extend its manufacturing operations to include the production of shock absorbers for rear wheels of Ford automobiles and small motor trucks.

James E. Albright, 282 Stuyvesant Avenue, Brooklyn, will build a one-story shop, 40 x 80 ft., at 1395 Atlantic Avenue, to be used for typewriter rebuilding and repair.

The Wend-A-Weigh Barrel Co., New York, has been incorporated with a capital of $150,000 by M. Mulvey, J. K. Guerin and S. S. Myers, 60 Wall Street, to manufacture fiber products.

The Knickerbocker Motors Co., Poughkeepsie, N. Y., has completed plans for the erection of an addition to its plant to cost about $40,000.

Frank M. Williams, Albany, New York State Engineer, is preparing plans and specifications for hydraulic power plants at the Mohawk River movable dams, for which bids are to be taken by W. W. Wotherspoon, State Superintendent of Public Works, Capitol, Albany.

Buffalo

BUFFALO, Feb. 17.

The Buffalo Dry Dock Co., Buffalo, has filed plans for a two-story punch shop addition at its shipyard on Ganson Street, to cost about $20,000.

The Brown Folding Machine Co., Eleventh and French streets, Erie, Pa., has commenced the erection of a plant extension.

The C. L. Walker Co., Erie, Pa., has been incorporated with a capital of $30,000 by H. L. Morse and associates, to manufacture soda fountain equipment.

The McCreary Roofing Co., Erie, Pa., has been incorporated with a capital of $80,000 by P. S. McCreary and others.

The Bancroft-Jones Corporation, Buffalo, has been incorporated with a capital of $200,000 by G. C. Jones, C. Horton and W. B. Grandison, to manufacture fabricated steel building products, etc.

Jaffray & Briggs, Rochester, N. Y., has been incorporated with a capital of $10,000 by James Jaffray, Charles L. Brigg

and George F. Hickson to operate an automobile repair works.

The Battery & Starter Co., 879 Main Street, Buffalo, manufacturer of starting and lighting equipment for automobiles, has increased its capital from $10,000 to $20,000.

The Stevens Corbett Pattern Works, 227 Mill Street, Rochester, N. Y., will make alterations in its three-story works on Allen Street, 38 x 60 ft., to cost about $5,000.

The Arthur L. Jones Corporation, Syracuse, N. Y., has been incorporated with a capital of $75,000 by L. V. Amann, H. L. Rinden and Arthur L. Jones, to manufacture oil engines, etc.

The Universal Radio Mfg. Corporation, Elmira, N. Y., has been incorporated with a capital of $50,000 by J. B. Cockendoll, W. C. Sallard, and H. A. Moore, to manufacture wireless apparatus, etc.

The Syracuse Chilled Die & Casting Co., Syracuse, N. Y., is arranging for the replacement of foundry equipment, transmission apparatus, etc., recently destroyed at its plant by vandals.

The Jerge Truck & Body Co., Elma, N. Y., has been incorporated with a capital of $150,000 by B. and L. and J. J. Jerge, to manufacture automobile trucks, bodies, and parts.

The Ross Heater & Mfg. Co., Buffalo, has completed plans for a brick and steel addition to its plant at West and Forest avenues, 50 x 75 ft. S. C. Ross is manager.

The Carbon Metal Products Co., Buffalo, has been organized with a capital stock of $12,000 and is arranging for the fitting up and equipment of a factory.

The Angola Tire & Rubber Co., Buffalo, has purchased land at South Division and Cedar streets for a factory and is having plans prepared. A. C. Bidwell, 302 Main Street, is president and manager.

Adams & Co., Johnstown, N. Y., are having plans prepared for a leather mill 145 x 180 ft., two stories, estimated to cost $65,000.

Armour & Co., Chicago, are having plans prepared by John H. Coxhead, architect, Liberty Building, Buffalo, for a three-story factory, 130 x 200 ft., of reinforced concrete and brick veneer, to be erected at Westfield, N. Y.

The Eastman Kodak Co., Rochester, has let contract to the Ferro Concrete Co., Cincinnati, for the erection of a five-story factory building, 160 x 200 ft., to cost $250,000.

The John Hunter Corporation, Fulton, N. Y., has recently been incorporated by John, F. C. and J. C. Hunter with a capital stock of $200,000 to manufacture an automatic gasoline saver.

New England

BOSTON, Feb. 17.

While the returns show that the applicants at the free employment bureaus in this section of the country secure one position for every four inquiries or thereabouts, this prevalent and well-known condition does not seem to have much effect upon the mind disposed to the strike as a means of social betterment. On Feb. 10 the day shift of some 200 men at the Walsh Steam Boiler Works, Holyoke, Mass., walked out in a body. The claim is made by the strikers that the president of the local union of boilermakers was discharged because of his union activities, and the company replies to this by stating that the discharge was upon other grounds for complaint. However, a demand is made for a rate of pay from 54 to 87 cents per hour. The company makes stacks, oil tanks, etc., for the United States Shipping Board.

The building of a machine shop extension of brick and steel, one story, 75 x 215 ft., is under way for the Mead Morrison Mfg. Co., East Boston, Mass.

The State Infirmary, Tewksbury, Mass., will submit to the Massachusetts Legislature an application for authority to spend $28,000 on a coal-handling plant.

The Watson Frye Co., Bath, Me., expects to be ready within a month to receive figures on a manufacturing plant of reinforced concrete. It will comprise about 20,000 sq. ft. of space and include a one-story foundry and a two or three-story factory structure.

Letting of the contract for a machine shop in the general scheme of a marine railroad at Fields Point, Providence, R. I., for the United States Shipping Board has been delayed owing to some changes made in the proposition, but will probably go forward in a few days.

Drawings are finished for the spar shop to cost $60,000 at Portsmouth, N. H., for the Navy Department.

A one-story brick factory building, $6,000, 40 x 80 ft., is planned by the Thomaston Mfg. Co., Thomaston, Conn.

The purchase of a new tubular boiler for heating a school house in the town of West Springfield, Mass., is under consideration by the committee.

The Hampton Co., Easthampton, Mass., will improve its power plant by raising boilers and installing stokers and coal-handling equipment.

Feb. 14 the paper mill machinery plant of H. C. Clark & Son, Lee, Mass., was damaged by fire to the amount of $30,000. A large part of the foundry was saved from destruction, but the machine shop, pattern shop and office were destroyed. Future plans are not ready for announcement.

The Milford Pink Granite Co., East Main Street, Milford, Mass., is considering the rebuilding of its local plant, recently destroyed by fire with loss estimated at about $200,000. The works were completed just before the fire, which occurred Jan. 31, and were soon to be operated at capacity. The buildings destroyed include the main cutting plant, 60 x 800 ft., machine shop, forge shop and electric power plant, with equipment comprising electric traveling cranes, air compressors, boilers and general machinery. The company also operates a plant at Keene, N. H.

Machinery and equipment from the Production Department of the Marine Engineering Co., Elkins Street, South Boston, Mass., and the munition works of the Excel Mfg. Co., Sherman Street, Boston, will be sold at public sale at the plants on Feb. 20, including machine tools, transmission apparatus and mechanical equipment. It is understood that these departments will be discontinued by the respective companies.

A company has been organized by M. Douglas Flattery and associates, Boston, Mass., to take over and operate the Murray & Tregurtha Co., South Boston and Quincy, Mass., manufacturer of high speed marine motors and hydroplanes. The new company will have a capital of $1,000,000 and proposes to extend the manufacturing operations at the plants to include the production of small hydroplanes.

The Fore River Shipbuilding Co., Quincy, Mass., a subsidiary of the Bethlehem Shipbuilding Corporation, is now giving employment to 26,000 workers at its Quincy and Squantum plants, about 1500 more than ever before employed, including the period of the war. The works are operating on two 8-hr. shifts instead of the full 24-hr. shift as heretofore. The company is understood to have sufficient work ahead to insure capacity operations throughout the present year and into 1920.

The Ware Products Co., Providence, R. I., has been incorporated with a capital of $60,000 by Edmund R. Ware and Lyman H. Kilton, Worcester, Mass.; Roderick W. Farmer, Hartford, Conn., and Charles H. Kenyon, Providence, to manufacture special mechanical products invented by Mr. Ware.

Owing to a curtailment in demand for its specialties, the Bay State Metal Wheel Co., East Templeton, Mass., is now operating on a five-day week basis. The Children's Vehicle Corporation, at the same location, has adopted a similar working schedule.

Philadelphia

PHILADELPHIA, Feb. 17.

The Bureau of Yards and Docks, Navy Department, Washington, will build an addition to the crane runway at slips Nos. 2 and 3 at the League Island Navy Yard, Philadelphia, to cost about $125,000. A new pump house, water tower and tank house will also be constructed by the Department at a cost of $15,500.

James Yocom & Son, Philadelphia, operating a foundry at 145 North Second Street, has been incorporated under the same name with a capital of $50,000.

Arrangements have been made for the sale of the Philadelphia Brass Works, East Downingtown, Pa., including foundry buildings on a site of about 17 acres, with equipment including brass rod mill, drop hammers, hydraulic press, machine tools, wood-working machinery, transmission equipment and other apparatus.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Huntington Park Avenue, Philadelphia, manufacturer of steel automobile bodies, has filed plans for the erection of a one-story extension, about 23 x 100 ft.

The Bethlehem Steel Co., Bethlehem, Pa., is planning for extensions and improvements in the property of the Cornwall & Lebanon Railroad, of which it assumed control on Feb. 1. The work will consist of new rolling stock and line betterments. The engine house near West Lebanon has been remodeled and enlarged to handle additional equipment.

The United States Asbestos Co., Manheim, Pa., is planning for the construction of a one-story addition to its works, 50 x 200 ft., and 50 x 100 ft.

The Susquehanna Collieries Co., Shamokin, Pa., is plan-

ning extensions and improvements at its properties to cost about $2,000,000. The work will consist for the most part of the erection of a large electric power plant at Green Ridge, and the complete electrification of the properties, operated under the name of the Pennsylvania, Richards, Scott, Hickory Ridge, Cameron and Luke Fidler collieries. Electric-operated machinery will be installed at the various plants to replace steam-operated equipment. A transmission system will also be constructed to include the properties for power supply.

The Fitzgerald-Speer Co., Pen Argyl, Pa., is considering the rebuilding of its four-story planing mill and wood-working plant, recently destroyed by fire with loss estimated of $100,000.

A one-story boiler plant to cost about $50,000 is being constructed by the Armour Leather Co., Chicago, Ill., at its works at Noxen, Pa.

The Klauder-Weldon Dyeing Machine Co., Jenkintown, Pa., is reported curtailing operations at its Yardley plant. It is understood that different parts of the works will be closed indefinitely.

The Meadville Malleable Iron Co., Meadville, Pa., will build a one-story power plant to cost about $10,000.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., is continuing the reduction of its working force, following the completion of Government orders, including a projectile contract which will soon be finished. For operations at the present time, the company is expecting to give employment to about one-seventh of the number of persons engaged during recent months.

The Belmont Motors Corporation, Harrisburg, Pa., it is reported, will soon start the erection of a $2,500,000 plant at Lewistown, Pa., which is to have 60,000 sq. ft. of floor space. It is to produce small automobiles and tractors. G. C. Gochnauer, Harrisburg, is president.

The machine and blacksmith shops of the Lalance-Grosjean Mfg. Co., manufacturer of tin and enameled ware, Harrisburg, Pa., were damaged by fire Feb. 13. The loss on the structure and equipment will be more than $10,000. Modern, fireproof buildings will be erected to replace those destroyed. John Grey is general manager.

Baltimore

BALTIMORE, Feb. 17.

Engineers are understood to have been ordered to prepare preliminary plans for a large ship repair plant for the Bartlett-Hayward Co. and Frank A. Furst, to be built in Anne Arundel County, near Baltimore. It is said that the total cost will be in the neighborhood of $4,000,000. No official announcement of the project has been made.

The Bethlehem Steel Co., Sparrows Point, Md., will build a one-story office building, 38 x 100 ft.

Oliver B. Rutherford, 104 Dolphin Street, Baltimore, will establish an automobile repair shop.

The following business houses in Baltimore will install motors: George Martin, 419 South East Avenue; the National Brass Co., 440 North Front Street; the American Tailoring Co., 625 Columbia Avenue; J. M. Raffel, 1702 Light Street; King Brothers, 208 North Calvert Street; Frederick Ice Cream Co., 1224 Greenmount Avenue; J. P. Cunningham, 123 South Charles Street; Bentley & Melvin and National Skirt Mfg. Co., 324 West Baltimore Street; Victory Bottling Co., 104 South Collington Avenue.

The Middletown Packing Co., Middletown, Md., will establish an electrically operated canning plant. E. A. Toms is secretary.

The Cambridge Bridge Co., Cambridge, Md., wants prices on gasoline and kerosene engines and 50-hp. motors.

Prices on automatic electric pumps and boilers are wanted by the Farmers' Mutual Exchange, Myersville, Md.

Anderson & Mathison, Norfolk, Va., have been incorporated with $10,000 capital stock to manufacture tools, machine parts, etc. A. N. Anderson is president.

The Humphreys Railways, Inc., Weems, Va., plans to build a marine railroad and install machinery. H. R. Humphreys is manager.

The Jackson Brothers Co., Whaleyville, Va., wants prices on locomotive cranes.

The Steel Casting Corporation, Altavista, Va., is seeking prices on drop forge machinery for the manufacture of scissors and razor blades.

The Miller Garage, Bridgewater, Va., will install automobile repair machinery.

Additional machinery will be installed by the Asheville Power & Light Co., Asheville, N. C.

J. G. White, Grover, N. C., wants prices on gasoline or kerosene engines.

Charles D. Briddell, Crisfield, Md., is considering the construction of a plant for the manufacture of knives and cutlery.

Electrical and mechanical operating equipment will be installed in the new plant now being erected by the Berkeley Woolen Mills, associated with the Virginia Woolen Mills, Winchester, Va., at Raleigh and Stephens streets, Martinsburg, W. Va., at an estimated cost of about $100,000.

The Maryland Pressed Steel Co., Hagerstown, Md., has arranged for the operation of its plant on a pre-war basis and is said to have contracted for the manufacture of 20,000 wire wheels for automobile use during the next 12 months.

The American Railroad Crossings Corporation, Bristol, Va., has been incorporated with a capital of $25,000 by H. H. Collins and L. D. Crump, Johnson City, Tenn., to manufacture railroad equipment.

The Navy Department, Washington, placed its new dry-dock at Portsmouth, Va., in service Feb. 1. It is said to be the largest in the United States, having a length of 1022 ft. and depth of 43 ft. It cost about $4,000,000, and has been completed about six months in advance of the time expected.

The Automotive Retread Co., Wilmington, Del., has been incorporated with a capital of $20,000 by E. E. Aberle and J. H. Dowdell, Wilmington, to manufacture steam-operated automotive machines.

The United States Buoy Corporation, Newbern, N. C., recently organized with a capital of $100,000, is arranging for the purchase of automatic lathes and other equipment for the manufacture of small buoys. C. S. Wallace is an incorporator of the company.

The Piedmont Auto Co., Lynchburg, Va., manufacturer of automobiles, has increased its capital from $1,000,000 to $5,000,000.

The National Machine & Electric Co., High Point, N. C., has been incorporated with a capital of $125,000 by Herman E. Wood, Thomas G. Shelton and J. C. Smith, to manufacture electric machinery, etc.

J. E. Downer, Alexandria, Va., is said to be planning for the rebuilding of his automobile machine shop, recently destroyed by fire.

The Gower-Mason Electric Co., Greenville, S. C., has acquired a two-story brick building on a site 140 x 250 ft., and will establish a machine and repair shop to specialize in the repair of motors and other electrical equipment, etc.

Pittsburgh

PITTSBURGH, Feb. 17.

The Hanly-Morris Carbon Remover & Auto Products Co., Pittsburgh, has been incorporated with a capital of $5,000 by F. W. Jones and associates.

The Standard Machine Co., Pittsburgh, has been incorporated in Delaware with capital of $200,000 by Glen D. Albert L. and Edgar E. Kammer, Pittsburgh, to manufacture machinery and to deal in second-hand machinery.

A one-story machine shop, 20 x 60 ft., will be erected at 18 Park Way, Pittsburgh, by the Second National Bank of Allegheny, Federal Street, for occupancy by a local organization.

The Sharlow Gas Coal Co., Blooming Rose, W. Va., is planning for the rebuilding of its power plant, partially destroyed by fire early in January with loss of about $12,000.

The Virginian Railway Co., Berkley, W. Va., will build a new electric power plant to furnish service for a distance of about 14 miles, from Elmore to Clarks Gap.

The property of the Becker Steel Co., Charleston, W. Va., will be sold by A. Mitchell Palmer, Alien Property Custodian, Feb. 20, at the company's works.

The Hancock Foundry & Machine Co., New Cumberland, W. Va., is considering the erection of a two-story addition to its machine shop, about 60 x 120 ft.

The Diamond Coal Co., Pittsburgh, is planning the immediate erection of a one-story machine and repair shop 45 x 90 ft., at its properties at Brownsville, Pa.

The Midvale Steel & Ordnance Co., Philadelphia, is working its Cambria works on an order for stayrods for the Emergency Fleet Corporation, to be used in connection with marine boiler installations.

The Taylor-Wilson Mfg. Co., McKees Rocks, Pa., is planning the rebuilding of its foundry, recently destroyed by fire with estimated loss of $20,000. It will be one-story 90x190 ft., estimated to cost $25,000.

The City Council, Oil City, Pa., is planning a one-story addition to the city boiler plant to cost about $45,000.

Milwaukee

MILWAUKEE, Feb. 17.

Although new orders for machine tools are of a scattering nature, limited to single tools or small lots, manufacturers in this section feel much encouraged by the developments, and it is believed that within 60 or 90 days the trade will begin to resume normal activity. Business placed the first half of February has been of an encouraging nature, while inquiries continue in generous volume and give promise of placements within a short time. Milling machine builders are getting a fair volume of business from manufacturers of gasoline engines, the tractor industry being a particularly good buyer. Electric light and power companies are coming into the market for hydroelectric and steam generating equipment, although there is a disinclination on the part of public service corporations to make such investments at this time because of high prices. Municipal buying is being resumed to a fair degree.

The labor situation is improving. Reports issued by the local office of the Federal Free Employment Bureau indicate that in the past week there has been a marked increase in the demand for skilled mechanics, while applications from machinists have not kept pace with the demand. The surplus of labor supply consists largely of semi-skilled or unskilled men, many of whom are not keen to accept permanent positions.

The Bernert Mfg. Co., 759 Thirty-third Street, Milwaukee, which recently was incorporated with a capital stock of $1,000,000 to manufacture grain-conveying and grain-handling machinery and equipment, expects to open a plant in leased quarters on Twelfth Street about March 1 or 15. It is hoped to undertake the erection and equipment of permanent works by July 1, although plans still are in a tentative state. The officers are: President and general manager, George Bernert; vice-president, C. C. Gilles; secretary and treasurer, G. G. Bernert; directors, Oswald Jaeger, P. C. Kolinsky and George L. Baldauf.

The Whitmore Machine & Foundry Co., Menasha, Wis., has been incorporated with a capital stock of $100,000 to take over the plant and business of the Sailor-Whitmore Machine Co. of that city. Joseph Sailor has disposed of his entire interest to L. W. Whitmore and other stockholders, including Bennett Plowright and Peter Verwey. The company operates a foundry and machine shop and manufactures a general line of machinery, including paper mill equipment. Leonard W. Whitmore is president and general manager.

The Anchor Shipbuilding Co., Washburn, Wis., is proceeding with the work of establishing plant and yards on the Chequamegon Bay front in that city and is negotiating for machinery and equipment.

The Sheboygan Aluminum Co., Sheboygan, Wis., is being organized by business men of Sheboygan, in association with manufacturers of aluminum ware in neighboring cities, and intends to erect a factory for the production of kitchen utensils, novelties and other sheet and drawn ware. The capital stock will be $200,000, of which amount $75,000 has been paid in. The names of the promoters are not divulged for the present.

The Harley-Davidson Motor Co., Milwaukee, manufacturer of motorcycles, has engaged the Federal Engineering Co., Stephenson Building, to prepare sketches and estimates of a proposed five-story factory addition, 50 x 150 ft., to be used largely for the production of bicycles, which are now being made under contract. The estimated cost of the improvement is $100,000, including tools and other equipment. Walter Davidson is president and general manager.

The Hayton Pump & Blower Co., 575 Second Avenue, Appleton, Wis., recently organized to manufacture centrifugal pumps and blower systems in the former plant of the Killen-Strait Tractor Co. in that city, has established a department to take contracts for custom casting and machine work and will also do a general jobbing business. T. R. Hayton is president and general manager.

The Kickhaefer Mfg. Co., 199-201 Oregon Street, Milwaukee, manufacturer of tools, dies and mechanical appliances, has increased its capital stock from $25,000 to $50,000. Edward A. Kickhaefer is president and manager.

The Rex Mfg. Co., 2907 Meinecke Avenue, Milwaukee, manufacturer of hardware specialties and lighting fixtures, has increased its capital stock from $25,000 to $50,000. It recently completed an addition and is installing some new equipment. Adam W. Kaufman is secretary and manager.

The National Drop Head Projector Co., Fond du Lac, Wis., is completing its organization and is preparing to erect a plant for the manufacture of portable motion picture machines. Forty men will be employed at the start. The promoters of the company include H. I. Collins, John W. Rogers, Herman Michler, John McCoy and A. O. Benz. J. M. Gooding is attorney.

The Board of Education, Marshfield, Wis., is taking sealed bids until March 15, at noon, for the construction of a junior high and vocational training school, 50 x 125 ft., two stories and basement, costing about $75,000, with complete equipment. The architects are Childs & Smith, Chicago. P. J. Kraus is secretary of the board.

The Burlington Brass Works, Burlington, Wis., has engaged H. L. Sierks, architect, 108 North Dearborn Street, Chicago, to prepare sketches and estimates of four new foundry and machine shop units, costing about $250,000 complete. The first unit will be erected the coming summer. Details of the building are not yet available.

The Sun Carburetor Co., Milwaukee, which has been incorporated with a capital stock of $100,000, has taken over and will develop the business of the J. B. D. Carburetor Co., which has been conducting a small experimental and machine shop on Howell Avenue. The company intends to erect a plant costing about $25,000, but is not ready to divulge plans. J. B. Drahanovsky, F. J. Ramler and Emil F. Deuster are the principal stockholders.

The Board of Education, Racine, Wis., has engaged Chandler & Park, architects, to prepare plans for a $250,000 high school building to be erected next spring and to contain a manual training department. L. S. Jones is president of the board.

The Appleton Hub & Spoke Co., Appleton, Wis., manufacturer of hardwood products, will build a new plant, 50 x 100 ft., with a complete new equipment of machinery, to replace the factory totally destroyed by fire several weeks ago. The investment will be about $30,000. John Tracy is general manager.

The Federal Electric Co., Milwaukee, has been incorporated with a capital stock of $10,000 to manufacture electrical goods, supplies and accessories. The incorporators are E. A. Lambert, Frank Ziekursch and L. M. Hesser.

W. L. Alban, architect, 347 Endicott Building, St. Paul, Minn., is preparing plans for a two-story fireproof high school building, with vocational training facilities, for the city of Chetek, Barron County, Wis. Bids will be taken about May 1. Amos Babcock is clerk of the Board of Education.

The Board of Education, Madison, Wis., has engaged Ferd. L. Kronenberg, architect, to prepare plans for a five-story fireproof school building combining general high school and vocational training facilities and costing about $350,000. The work probably will be done this year and it is expected that bids will be taken by May 1.

The Nash Motors Co., Kenosha, Wis., manufacturer of passenger and commercial vehicles, is erecting a brick and steel foundry addition, 50 x 200 ft., which will cost about $50,000 with new equipment.

Chicago

CHICAGO, Feb. 17

The aggregate of miscellaneous sales is fairly good, but there is much evidence that action on a good volume of inquiries is withheld in the hope of obtaining lower prices. Some bright spots appear in the situation, such as the lively demand for milling machines, which has caused one Milwaukee manufacturer to put on a night shift, though it is to be noted that the company concerned manufactures an exceptional machine, in design and quality. The outlook for milling machines and vertical and horizontal boring machines is good.

Buying is almost entirely in small lots, the total of which exceeds that of 1914 levels, although the overhead of conducting business to-day is an offsetting feature, in some cases being practically double.

At noon, Feb. 15, the Government closed the taking of bids for the machinery purchased by the Cribben & Sexton Co., Chicago, for the making of shells, but which was never used. It is expected that consumers will take a large part of the equipment, and according to expectations will offer from 75 to 80 per cent of the original prices. Consideration of the bids, and possibly the awards, will be finished in about one week.

There is a vast amount of automatic screw machinery on the market, in addition to hand screw machines and turning machines in general. In Dayton there are large groups of machines to be disposed of by war contractors without the intervention of the Government. Most of the machinery thus to be offered is above the standard of condition usually found in used tools.

The Conradsen Machine Tool Co., of which C. M. Conradsen, well known as a designer of machine tools, is the head, has plans for extensive expansion of manufacturing facilities at Green Bay, Wis. The company has been reorganized. It has acquired a 12-acre site and will erect a modern machine shop, drafting department.

and office. Machines of various types designed by Mr. Conradsen will be built.

The J. F. Bitterman Co., Joliet, Ill., has been incorporated with a capital stock of $10,000 to do sheet metal work. Its plant is at 110 North Stevens Street, Joliet, the incorporators being J. Bitterman, William C. Henning and Lee F. Folkers.

The Precision Metal Works, 1443 Carroll Avenue, Chicago, has been granted a permit for the erection of a two-story factory, 117 x 153 ft., at 3100 to 3110 Carroll Aenue, the architects being Davidson & Weiss, 53 West Jackson Boulevard, Chicago. The cost will be $75,000.

The Interstate Iron & Steel Co., 7850 South Chicago Avenue, Chicago, will build a two-story manufacturing plant, 48 x 56 ft., at a cost of $10,000. The company manufactures wire and wire products in addition to iron and steel.

The Chicago Bridge & Iron Works, Washington Heights, Ill., will establish a steel-barge plant on a site of five acres in Indiana Avenue, near 135th Street, South Chicago. It is reported that steel coal barges 110 ft. in length, of 500 tons capacity and of uniform construction, will be built under the supervision of the United States Navy Department. Traveling cranes will be a part of the equipment.

Fire in the ginning room of the Peoria Cordage Co., Peoria, Ill., Feb. 1, did damage estimated at $45,000. The factory was busy in the manufacture of binder twine. A spark resulting from friction in machinery is held responsible for the fire.

James L. Carey, paper mill engineer, 208 North Laramie Avenue, Chicago, is preparing plans for a three-story factory, 119 x 135 ft., at Rock Falls, Ill., for the Rock Falls Box Board Co., to cost $125,000.

The Wickert Valve Co., Chicago, has been incorporated in Delaware with capital of $200,000 by William Wickert, A. J. Roy and A. D. Crothers, Chicago, to manufacture valves.

The Apex Appliance Co., 3223 West Thirtieth Street, Chicago, manufacturer of washing machines, will build a new two-story plant at 3241-7 West Thirtieth Street, 60 x 80 ft., to cost $25,000.

The Belden Mfg. Co., South Western Avenue, Chicago, manufacturer of cables, etc., has increased its capital from $1,000,000 to $1,500,000.

The Chicago Fuse Mfg. Co., 1014 Congress Street, is having preliminary plans prepared for the construction of a new seven-story plant at Congress and Morgan streets, to cost about $165,000. It is proposed to inaugurate building work within a few months.

Detroit

DETROIT, Feb. 17.

For the first time in two months a substantial improvement in industrial conditions in this district became evident the past week. Manufacturing concerns, apparently readjusted to peace conditions in many cases, are resuming activity on a large scale. Unemployment has dropped between 5000 and 10,000, to about 25,000, and the situation is expected to steadily improve.

Sub-contractors are delaying the settlement of Government war contracts by not filing their claims, according to the Michigan section of the National Association of Manufacturers of War Materials. Figures have been received showing that the Detroit District Ordnance Board has 276 contracts to settle, of which only 82 have been presented. Of the 82 presented, 12 have been allowed, while work on the others is progressing rapidly. Failure of prime contractors to file their claims because of neglect of sub-contractors to make statements is holding up the work.

Building activity is also beginning, and each week shows an increase in the value of permits issued.

Machine-tool jobbers report a steady increase in business the past week, and anticipate a record demand within a short time.

Fire, Feb. 14, destroyed the five-story assembling plant of the C. R. Wilson Body Co., Detroit, with an estimated loss between $400,000 and $500,000. Approximately $250,000 worth of machinery was injured or destroyed. The addition to the company's plant at Clay Avenue and the Grand Trunk Railroad, which will give the plants in Detroit and Bay City a daily capacity of 800 bodies, will be completed within 60 days, the building operation covering a period of five months. The extension is 80 x 360 ft., three stories, and has 86,400 ft. of floor space.

The Blood Bros. Machine Co., Alegan, Mich., has increased its force to 200 men, and its product is now worth $1,000,000 a year. The transition to peace work from Government contracts has been accomplished, and the company reports that it is behind in its orders.

The Hayes Machine Co., Detroit, has filed articles of incorporation with R. Frederick Hayes, Edwin N. Sprague and Thomas May as principal stockholders. The company will manufacture machines for grinding crank shafts.

The Owosso Bronze Bearing Co. of Owosso, Mich., has been organized with a capital stock of $25,000 to manufacture bronze castings and bearings for automobiles, trucks and tractors. James Van Pelt heads the company. He was former superintendent for the Buick Motor Co., Flint, and later general superintendent of the Johnson Bronze Co.

It is reported that the Sparks-Withington Co., Jackson, Mich., is contemplating the erection of a radiator manufacturing plant in Cleveland. The company makes the Spartan horns, fans, vacuum tanks and other motor car parts.

The name of the Spranger Wire Wheel Co., Detroit, has been changed to the Detroit Wire Wheel Corporation, and new officers have been elected as follows: President, Fred R. Schmalzriedt; vice-president, Jacob M. Schaefer; secretary, John F. Reinke, and treasurer, William Finzel. The corporation has completed its Government contracts and is getting into production on commercial work.

The Grand Rapids Wire Products Co., Grand Rapids, Mich., capitalized at $10,000, has been incorporated by Peter D. Pearce, John H. Haven and others.

The Auto Specialties Co., St. Joseph, Mich., which recently acquired 100 acres of land, has started work on a duplicate plant, which when completed will give the company 70,000 sq. ft. of floor space.

The E. E. Woodward Sheet Metal Works, Niles, Mich., is a new enterprise of which E. E. Woodward is the head.

Cincinnati

CINCINNATI, Feb. 17.

Domestic business in machine tools is improving and scattered orders from automobile and tractor manufacturing concerns are increasing. Second-hand dealers in machine tools are still somewhat surprised at the comparatively small number of machines that have been put on the market by the Government or Government contractors. So far it is evident that the announced intention of remarketing machine tools, so as not to flood the market, will be carried out faithfully. It is also stated that the number of machine tools in former war plants that can be put back into commercial work has been very much exaggerated.

Information received by several machine-tool makers through their agents in England indicate that the embargo on shipments of machinery to England, to go into effect March 1, will not be as stringent as was supposed. Definite information is yet lacking, but it is not thought by dealers in England that legitimate firms will be cut off from importing machine tools from this country. It is stated by a prominent local machine-tool man that in the end the responsible importer of machinery will be benefited because the fly-by-night importer whose financial responsibility is questioned will practically be eliminated.

The local labor situation is not at all discouraging, and a survey of machine tool plants in this vicinity shows a loss of only 17 men in the total number hired and laid off in the week of Feb. 9 to 15.

The George E. Curd Co., Union Central Building, Cincinnati, builder of industrial railroad cars, has acquired title to a plant in Norwood. It has been operating the plant over a year and intends to enlarge it later.

The Southern Locomotive Valve Gear Co., Knoxville, Tenn., is inquiring in this market for a second-hand 6-ft. radial drilling machine and a 42-in. horizontal milling machine.

It is reported that work will begin at an early date on the proposed plant of the Fordson Co. at Hamilton, Ohio. It will be used for the manufacture of tractors.

The Willys-Overland Co., Toledo, Ohio, has purchased the woodworking plant of the Tucker Woodwork Co., Sidney, Ohio, which it will use for manufacturing steering wheels and top bows for automobiles. Considerable equipment will be added.

The Miami Trailer Co., Troy, Ohio, has increased its capital stock from $25,000 to $100,000. An addition to its plant is contemplated.

The Monitor Motor Car Co., Columbus, Ohio, has tentative plans under way for enlarging its plant.

The Ford Motor Co. resumed operations in its assembling plant at Columbus, Ohio. The plant was engaged for some time on war work.

The Chillicothe Tire & Rubber Co., Chillicothe, Ohio, recently organized, is placing orders for machinery for an automobile tire plant.

The Studebaker Corporation, South Bend, Ind., will make some extensive additions to its plant during the summer.

Cleveland

CLEVELAND, Feb. 17.

New inquiries have come from the General Motors Corporation for a large amount of equipment for a new plant in Detroit to manufacture automobile differentials, which are expected to be placed this week. This interest is also sending out inquiries for a large amount of equipment for the Samson tractor plant in Janesville, Wis. Generally the market shows little change. There is a moderate volume of small orders, mostly for one or two machines, but these are almost wholly from the automobile and tractor fields. The demand for automatic machinery is fairly good. One auto manufacturer of automobile parts has placed an order with a local maker for about 50 machines, and quite a few other inquiries and orders for from one to five machines have come out. A local company making drilling machinery has at present so many orders on its books that it started a night shift a few days ago. A new inquiry has come from the Pennsylvania Lines for a number of small machines.

Two new inquiries aggregating 30 to 40 machines of various types have come from Belgium. One company states that its plant was completely destroyed in 1914 and that it now has another plant under way. Another advises that all its machinery was stolen by the Germans and its plant demolished. It now plans to purchase duplicate equipment.

Plans are under way for building drydocks along the Atlantic Coast to take care of the increase in the number of ships being built by the Emergency Fleet Corporation, and two inquiries have come out for shop equipment, including plate bending rolls, plate planers, punches and shears. Considerable inquiry for punching and shearing machinery is coming from French, Belgium and Italian shipbuilders, but American manufacturers seem doubtful whether they will be able to meet British competition unless there is further reduction in ocean freight rates. Prices on punching, shearing and allied machinery have been reduced from 10 to 15 per cent by a local manufacturer.

Government reports as to the extent of the unemployed in Cleveland are discredited by men most familiar with the local labor situation. According to latest Government estimates there are 70,000 unemployed in Cleveland. According to estimates made here, however, the figures do not exceed 20,000 in the metal industries, including steel plants and foundries.

The Hydraulic Steelcraft Co., Cleveland, has been incorporated with a capital stock of $100,000 as a manufacturing unit of the Hydraulic Pressed Steel Co. It will take over the fabricated products, including conductor pipe, eave trough, roofing, etc., made by the Canton Sheet Steel Co., an allied interest, and the manufacture of concrete forms which is now a department of the Hydraulic company. A new plant will be built in Canton.

The Wellman-Seaver-Morgan Co., Cleveland, has added to its line of products the manufacture of port and terminal equipment which will include machinery for fueling, loading and unloading ships and for handling package freight. Another new product is a motor-driven capstan. It has also started the manufacture, at its Akron, Ohio, plant of an extensive line of rubber machinery, including calenders, mixing and grinding mills, tubing machines, tire presses, etc.

Cleveland men have acquired control of the Carroll Foundry & Machine Co., Bucyrus, Ohio, by the purchase of two-thirds of the stock. The company has been engaged in the manufacture of cranes. A re-organization will take place this week. The names of the new owners have not yet been announced.

The W. S. Bidle Co. has increased its capital stock from $25,000 to $100,000 and contemplates enlarging its plant to double its capacity. It is engaged in commercial heat treating work.

The Cleveland Automobile Co., Cleveland, has been organized by officials of the Chandler Motor Car Co. to manufacture a smaller and lower priced automobile than is made by the Chandler company. F. C. Chandler and Samuel Regars, president and treasurer respectively of the Chandler company, are associated with the new enterprise. It will have a capital stock of $1,400,000 preferred and 14,000 shares of common stock with no par value.

The Sammer-Adams Co., Cleveland, which was recently organized to take over the plant of the Permanent Machine & Mfg. Co., 2934 East Fifty-fifth Street, has taken possession and is manufacturing a line of jigs, fixtures, dies and other products.

The Ackerman Wheel Co., Cleveland, maker of a patented type of automobile wheel, has changed its name to the Atlas Wheel Co.

The Reflex Ignition Co., Cleveland, is having plans prepared for its proposed new plant, 80 x 160 ft. It has increased its capital stock from $100,000 to $250,000.

It is reported that the General Equipment Co., Conneaut, Ohio, contemplates the erection of a new foundry.

The Colonial Foundry Co., Louisville, Ohio, has been organized by Clarence M. Converse, Canton, and others with a capital stock of $65,000, and has purchased the foundry in Louisville, formerly occupied by the Bonnot Mfg. Co., and will manufacture gray iron castings.

The Toledo Scale Co., Toledo, Ohio, contemplates the erection of a new plant.

Ernest McGeorge, architect and engineer, 1900 Euclid Building, Cleveland, is preparing plans for a machinery plant to be erected by the Peerless Bread Machinery Co., Sidney, Ohio.

The Toledo Machine & Tool Co., Toledo, will take bids about April 1 for the erection of a machine shop and foundry to cost about $150,000.

The Watson Mfg. Co., 420 Knapp Street, Toledo, plans the erection of a machine shop, 60 x 200 feet.

The Willys-Overland Co., Toledo, plans the erection of a machine shop and heat treating plant in connection with its Elyria, Ohio, plant, and placed orders the past week for a number of machines.

The Mahoning Foundry Co., Youngstown, Ohio, has completed a new two-story building, 190 x 240 ft., to increase its production of warm air furnaces.

The plant of the McNeil Boiler Co., Akron, Ohio, was badly damaged by fire a few days ago, the loss being estimated at nearly $200,000. Plans for rebuilding are said to be under way.

The Goodyear Tire & Rubber Co., Akron, Ohio, will shortly place contracts for the erection of a new $500,000 factory.

The Galion Metallic Vault Co., Galion, Ohio, recently increased its capital stock from $200,000 to $400,000, and expects to need additional equipment, including shears, rolls, etc.

Indianapolis

INDIANAPOLIS, Feb. 17.

The Marion Foundry Co., Marion, Ind., has been incorporated with $30,000 capital stock to manufacture machinery and machine products. Among those interested are Ora E. Butz, Fred W. Case, L. Leroy Closcoe, George L. Cole, Charles C. Cring and Kenneth E. Morris.

The Joseph W. Hays Corporation, Michigan City, and the South Bend Brass & Aluminum Co., South Bend, Ind., have been consolidated and the latter plant will be moved to Michigan City. The Hays Corporation has heretofore been purchasing its castings in various parts of the country.

The Anderson Foundry & Machine Co., Anderson, Ind., will increase its capital stock $500,000 to enlarge its plant and business. The present plant consists of an assembling building, 120 x 150 ft., machine shop, 80 x 300 ft., and two foundries, 60 x 180 ft. and 60 x 120 ft. William N. Durbin is president.

The Laporte Foundry & Furnace Co., Laporte, Ind., has increased its capital stock from $50,000 to $100,000.

The Madison Motors & Tractor Corporation, Madison, Ind., with $1,200,000 capital stock, is the outgrowth of the merger last fall of the Madison Motors Corporation, Madison, and the Bull Tractor Corporation, Minneapolis. The original purpose was to manufacture tractors and trucks for the Government, but since the cessation of hostilities it was decided to increase the capital to $1,750,000 and continue the manufacture of pleasure cars as well as tractors. Cecil E. Gibson is president.

The Haynes Stellite Co., Kokomo, Ind., will enlarge its plant by the erection of two new buildings, each 60 x 132 ft.

The Interstate Car Co., Indianapolis, has begun work on a new car repair shop, 83 x 245 ft., at Massachusetts Avenue and Sherman Drive.

The machine shop of the Indianapolis Drop Forging Co., 1800 Madison Avenue, will be enlarged by an addition, 50 x 136 ft., to cost $25,000.

The Board of Trustees, Anderson, Ind., has received permission from the Public Service Commission to issue bonds for $90,000 for extensions and betterments in its municipal electric power plant.

The Maxwell Implement Co., Valparaiso, Ind., manufacturer of tools, etc., has increased its capital from $40,000 to $70,000.

The Super-Engine Mfg. Co., Indianapolis, Ind., has been incorporated with a capital of $50,000 by Frank and Elmer Wood and William H. Bettcher to manufacture engines.

The Remy Electric Co., Anderson, Ind., manufacturer of automobile equipment, and for the past five years affiliated with the United Motors Corporation, has become a subsidiary of the General Motors Corporation. It is understood that no changes in present operation are planned, with the exception that at a later date it is proposed to erect an administration building at the local works, removing the present offices and laboratory at Detroit to this location.

The Williams Furniture Co., Richmond, Ind., has been incorporated with a capital of $40,000 by William D. Williams, Edward V. Williams and Fred S. Anderson, to manufacture furniture.

The Cummins Engine Co., Columbus, Ind., has been incorporated with a capital of $50,000 by C. L. Cummins, J. R. Dunlap, Ernest D. Snider and Frank N. Richman, to manufacture combustion engines.

The Indianapolis Forging Co., Indianapolis, Ind., is planning for the remodeling of its works on Madison Avenue, to increase the production facilities.

The Indiana Refining Co., Lawrenceville, Ind., is planning for the erection of a new one-story car shop to cost about $40,000.

The Central South

LOUISVILLE, Feb. 17.

The Big Five Zinc & Spar Co., Carrsville, Ky., will open bids on April 1 for engines, hoists, pumps, washers and general zinc-mining equipment.

Bodley Booker, Booker Box Co., Louisville, is in the market for a metal cutting lathe, new or second hand, with 5-ft. clearance between chuck and spindle.

Edwin H. Haag, 1707 West Broadway, Louisville, has sold the Haag Auto Co. and will equip a new shop. He reports that he is in the market for a drill press, lathe, chain block, electric emery wheel and stand, air compressor and full equipment for an auto repair shop.

The Anglo-American Mill Co., Owensboro, Ky., manufacturer of milling machinery, has filed amended articles of incorporation, increasing its debt limit to $5,000,000 to take care of increased business.

The United States Coal & Coke Co., Gary, W. Va., is planning for the erection of a new coal tipple at Lynch, Ky.

The Gallatin Buggy & Implement Co., Gallatin, Tenn., manufacturer of tools, etc., has increased its capital from $15,000 to $40,000.

The Thornton Trolley Wheel Co., Ashland, Ky., recently organized, is planning for the erection of a plant to manufacture trolley wheels. The initial works will have a capacity of about 500 wheels per day and will be equipped with lathes, milling machine and other tools. P. M. Scott is president and general manager.

B. F. Avery & Sons, Louisville, have about completed plans for additions to their plant, foundry, etc., for manufacturing a new line of harvesting machinery.

The Republic Welding Co., Louisville, has moved into larger quarters at Nineteenth and Walnut streets.

St. Louis

ST. LOUIS, Feb. 17.

The Currie-Finch Brick & Lumber Co., T. J. Currie, president, Jackson, Miss., will equip a brick-making plant and is in the market for the machinery.

The Farmers' Co-operative Gin Co., Flippin, Ark., is in the market for equipment for a 70-saw ginnery.

The Ozark Light & Power Co., Eureka, Ark., James Bowen, president, has been organized with a capital of $100,000 and will equip a plant.

The town of Norman, Okla., will equip a $75,000 electric power and light plant under the direction of the mayor, Steven Hutchin.

The city of Marshall, Mo., will expend $75,000 for the erection and equipment of an electric light and power plant.

The Deeming-Endsley Co., Texarkana, Ark., Horace F. Endsley president, capital $350,000, will equip a plant for the manufacture of a railroad switch joint safety device.

The Oklahoma Hay Press Mfg. Co., Oklahoma City, Okla., G. T. Taylor, James F. White and H. K. Woodruff interested, will equip a $100,000 plant for the manufacture of hay presses.

The Douglass Tank Co., Okmulgee, Okla., will equip a $50,000 plant for the manufacture of steel tanks.

The Oklahoma Producing & Refining Co., 14 Wall Street, New York, will add $2,000,000 to its capital of $10,000,000 for the extension of its refining plants in Oklahoma fields.

The Dixie Cotton Oil Co., Little Rock, Ark., is in the market for a 1000-hp. cross compound condensing steam engine.

The Leach Nobles Ice Co., Marks, Miss., E. K. Leach secretary-manager, will equip an ice plant requiring about $12,000 worth of machinery.

The Ada Ice & Cold Storage Co., Ada, Okla., Arthur Marshall secretary-manager, 709 Sumpter Street, Dallas, Texas, will equip a plant requiring about $15,000 worth of machinery.

The Louisiana Saw Mill Co., Glenmora, La., will increase its capital by $250,000 to enlarge its capacity.

The Calcasieu Saw Mill Co., Lake Charles, La., will install mill equipment at some Rapides Parish point requiring about $60,000 worth of machinery.

The Lock-Moore Lumber Co., Westlake, La., will equip a saw and a planing mill with a daily capacity of 100,000 ft.

The Auto Machine Repair & Brass Foundry Co., Tulsa, Okla., Edward C. Hofstra and others interested, has acquired a plant which it will equip to manufacture brass and aluminum castings.

The Ozark Mining & Milling Co., E. E. Scofield manager, Yellville, Ark., is in the market for steam-driven air compressing machinery.

The Natchez Oil Mill, Natchez, Miss., is in the market for a Corliss engine, a 75 k.v.a.c. generator, and considerable heavy motor equipment.

John R. Elberg, 3304 Campbell Street, St. Louis, is building a new one-story and basement plant, 103 x 140 ft., at 2900-6 Cherry Street, to be equipped for the manufacture of automobile bodies. The structure is estimated to cost $20,000.

The American Cast Iron Pipe Co., Birmingham, Ala., is said to have acquired the plant of the Beggs Pipe & Foundry Co., which will be used for the production of special pipe shapes, and will be remodeled and improved.

Edward M. Johnson, Blytheville, Ark., is organizing a company for the establishment of a plant for the manufacture of spark plugs and similar products.

The Pacific Northwest

SEATTLE, Feb. 11.

The general strike called in Seattle, Feb. 6, by about 120 unions, completely paralyzed all industrial activity for four days. The men, however, are gradually drifting back to work, and it is conceded that the strike has been broken. Shipyard strikers continue to stand firm on their original demands and all steel yards and allied industrial plants have been idle since Jan. 21. General business as a result is in a very chaotic state. Manufacturing in all lines has been seriously hampered and some orders have been canceled on account of the uncertainty of deliveries. The labor supply is more plentiful and in some districts the number of unemployed is creating a serious condition.

It is expected that the resumption in the spring of building operations will set a record for new construction, and lumber manufacturers are looking forward to an unusually active demand. The cessation of wooden shipbuilding in the Northwest left lumbermen with canceled orders for about 50,000,000 ft. of lumber. In many cases the lumber was cut and ready for shipment.

The Oregon Brass Works, Portland, plans to install equipment for the manufacture of journal bearings and railroad supplies. It has been engaged in shipyard orders, and the suspension of the wooden ship program has caused a serious situation. The plant has a daily capacity of 7000 lb. of brass and bronze castings.

The L'Air Liquide Society, Montreal, Que., will erect a branch factory in Vancouver, B. C. The main structure will be 75 x 85 ft., of brick, costing $25,000. At least $50,000 will be spent in equipping the plant. It will also engage in the manufacture of acetylene gas and do oxy-acetylene welding.

Announcement has been made of the sale of the structural steel business of the Northwest Steel Co., Portland, to a new concern to be known as the Northwest Bridge & Iron Co. The Northwest Steel Co. will confine its efforts to construction of steel ships. The new company plans the establishment of a plant in Portland, on a site already selected.

The Portland Galvanizing Co., Portland, plans the construction of a one-story shop, to be equipped with new machinery.

The Universal Nut Lock Co., Portland, contemplates moving its plant to Seattle, where a new building will be constructed and the equipment increased.

The Barrett Roofing & Supply Co., Vancouver, B. C., has completed arrangements for building a factory at Eburne, B. C., for the manufacture of roofing materials. It will cost about $80,000.

The Automatic Wrench Co., Wenatchee, Wash., has been incorporated with $50,000 by T. R. Holland, et al. It is reported that a manufacturing plant will be established.

D. C. Morston, Portland, plans the establishment in Castle Rock, Wash., of a factory for the manufacture of boxes, handles, etc. A site has been secured.

The Wenatchee Woodworking Co., Wenatchee, Wash., has completed plans for rebuilding its plant recently burned. New machinery will be installed. S. A. Ewing is manager.

William Van Woert, Chehalis, Wash., plans the establishment of a local toy factory.

The Mickle Lumber Co., Enterprise, Ore., will erect a sawmill with a daily capacity of 30,000 ft.

The Pacific Engineering & Equipment Co., Portland, Ore., has purchased the plant of the Standard Galvanizing Co. of that city and has plans under way for trebling the capacity.

The Astor Tool Co., Sandpoint, Idaho, has been formed to manufacture a patented shovel. R. S. McCrea and J. C. Brewster are the incorporators.

The Astoria Marine Iron Works Co., Astoria, Ore., has purchased property on Young's Bay for $30,000, where it is said it intends to erect a new plant, moving its present works to that site.

J. H. Mast, foundryman, Portland, states that he intends to build a $20,000 iron foundry at Nampa, Idaho. It is said that the equipment of the Nampa Iron Works, which has been closed for some time, will be taken over, and additional machinery, including heavy lathes, will be installed.

Texas

AUSTIN, Feb. 15.

As a result of the extensive oil developments in the central western Texas fields the demand for well drilling machinery and equipment is unprecedentedly large and many operators find difficulty in obtaining prompt deliveries of materials. There is also a congestion of freight traffic and new machinery supply houses are being established at different points convenient to the scene of activity.

The Baxter Co., Abilene, will construct a plant for the manufacture of oil well machinery and equipment at a cost of several hundred thousand dollars.

The Wichita-Ranger Oil & Refining Co., Wichita Falls, will build a refinery with a daily capacity of 2500 bbl. upon a tract of 40 acres which the company has purchased. It will also lay a pipe line from its producing wells at Burkburnett to the proposed plant.

It is announced that as a result of an addition of $17,000,000 to its available capital, the Humble Oil & Refining Co., Houston, will construct a large refining plant on the ship channel near that city. It will also increase its other oil operations.

The Cooper Light & Ice Co., Cooper, has been incorporated with a capital of $50,000 to equip an electric light and ice plant. Ed Hendricks, Cooper, is a stockholder.

The Steves Sash & Door Co., San Antonio, has been incorporated with a capital of $250,000 to manufacture building materials. Albert Steves, Sr., is a stockholder.

The Grand Saline Lumber & Supply Co., Grand Saline, recently incorporated with a capital stock of $100,000, will manufacture lumber and builders' supplies. W. W. Bradley is a stockholder.

Spang & Co., Butler, Pa., have purchased a site at Cisco upon which they will construct a plant for the manufacture of oil well machinery and supplies.

The Cisco Gas & Electric Co. will make improvements to its electric light and power plant and ice factory at a cost of about $50,000.

Wagner & Steiner, oil operators, Fort Worth, plan to construct a pipe line from Ranger to Fort Worth. They will also build a refinery at Ranger.

The Hull Iron Works, Hull, has been incorporated with a capital of $20,000. George Bryant is a stockholder.

The Victory Oil & Refining Co., Salt Lake City, Utah, plans to construct an oil refinery at Fort Worth. Daniel F. McCoy is vice-president and general manager.

Canada

TORONTO, Feb. 15.

The demand for machine-tools is fairly active but rather sporadic. The bulk of the business is for pulp and paper machinery and shipyard equipment, with a good call for railroad tools. Dealers are not taking much interest in the disposal of tools that have been used in shell factories, although a number of these machines have been absorbed for general work.

Parry Sound, Ont., will build an electric light plant and will require machinery costing $125,000. J. D. Broughton is clerk.

The Dominion Iron & Steel Co., Sydney, N. S., has awarded the contract for the construction of an electric plant to cost $1,000,000 to the Foundation Co., Ltd.; Sydney, N. S., and Bank of Hamilton Building, Montreal.

The B. & K. Shingle Co., New Westminster, B. C., will build an addition to its factory and install machinery costing $7,500.

Plans are in progress for a pulp and paper mill at Port Arthur, Ont., costing $7,500,000 for J. J. Carrick, 13 Cumberland Street North. H. S. Ferguson, 200 Fifth Avenue, New York, is architect and engineer.

The Whitman & Barnes Mfg. Co., 81 Thorold Road, St. Catharines, Ont., has had plans prepared and will start work immediately on the erection of a factory to cost about $60,000. W. J. Elliott is manager.

D. B. Hanna, president Canadian National Railway, Toronto, has confirmed the rumor that the shops at St. Malo, Que., erected several years ago at a cost of $1,000,000, will be put in operation. It is stated that about six months will be required to put the plant in order and install the necessary equipment. Mayor Lavigueur is interested in the project.

The Quebec Central Railway has decided to commence the construction of permanent car shops and other improvements at Newington, Sherbrooke, Que.

The Renfrew Machinery Co., Ltd., Renfrew, Ont., is in the market for a small electric spot welder, 550 or 110 volt, 60 cycle, two phase.

F. Clark, 95 Woodland Avenue, St. Catharines, Ont., is in the market for a complete welding outfit.

The Swedsih Steel & Importing Co., Ltd., 503 Canadian Express Building, Montreal, is in the market for a lathe with 84-in. face plate, tail stock and one or two rests.

Hyslop Brothers, Ltd., 12 Shuter Street, Toronto, is in the market for one motor generator set, direct drive, single unit base, 5-hp., three phase; also 1 lathe, 16-in. gap, 7½ to 8 ft. long with compound rest.

The Town Council, Outlook, Sask., is in the market for a 25-hp. engine and pump, lift of pump about 30 ft. Thomas G. Colby is clerk.

Hutchison Brothers & Co., Ltd., 409 Bay Street, Victoria, B. C., has let contract for the construction of a foundry to cost about $100,000 to the Cameron Investment & Securities Co., Ltd., Central Building, Victoria, B. C.

The Hamilton-Toronto Sewer Pipe Co., Ltd., Wentworth Street North, Hamilton, Ont., will build an addition to its plant to cost $25,000.

The Society L'Air Liquide, 1 Ernest Street, Maisonneuve, Montreal, has let the general contract to R. H. Harman & Son, 248 Dupont Street, Toronto, for the erection of a factory at London, Ont., to cost $60,000.

Jennings & Bailey, Railroad No. 3, Bancroft, Ont., are in the market for a 30-hp. locomotive boiler.

W. G. Lee, Markdale, Ont., is in the market for a blacksmith drill, either power or hand.

A. F. Campbell & Son, Arnprior, Ont., are having plans prepared for the erection of a factory to cost about $60,000. Andrew Campbell is manager.

Plans are being prepared for an addition to the plant of the Goodyear Tire & Rubber Co., New Toronto. C. H. Carlisle, 152 Simcoe Street, Toronto, is in charge. The company is in the market for one 50-ton hydraulic jack; one pair 20 or 25-ton ratchet gear drive screw jacks; one 50 or 70-ton ratchet gear drive screw jack and one 36-in. power squaring shears to handle 16-gage metal.

Government Purchases

WASHINGTON, Feb. 17.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, for supplies for the naval service, as follows: Schedule 3758, for Alexandria, Va., 1 set cutting dies and 2 geared horn presses, opening March 18; 3772, for Washington, 6 drill presses, opening March 18; 3775, for Alexandria, parts to be machined and finished, opening March 18; 3787, for Washington, one 40-hp. motor and controller, opening March 18; 3788, for South Boston, 2 air compressors, opening March 18; 3800, for Norfolk, 14 turret and engine lathes and 31 radial and upright drills, opening March 25; 3802, for Alexandria, Va., machining and finishing parts, opening March 25; 7773½, for Philadelphia, 2 electric trolley hoists, opening Feb. 25; 7784½, for Mare Island, 32 lathe chucks, opening Feb. 28.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Merchant iron, base price	4.57c
Refined iron, base price	5.32c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Norway bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.97c
1 to 6 in. x ⅜ to 1 in.	3.97c
1 to 6 in. x ¼ and 5/16	4.07c
Rods—⅝ and 11/16	4.02c
Bands—1½ to 6 x 3/16 to No. 8	4.57c
Shapes:	
Beams and channels—3 to 15 in.	4.07c
Angles:	
3 in. x ¼ in. and larger	4.07c
3 in. x 3/16 and ⅛ in.	4.32c
1½ to 2½ in. x ⅛ in.	4.32c
1½ to 2¾ in. x 3/16 in. and thicker	4.07c
1 to 1¼ in. x 3/16 in.	4.12c
1 to 1¼ in. x ⅛ in.	4.17c
⅞ x ⅞ x ⅛ in.	4.22c
¾ x ⅛ in.	4.27c
⅝ x ⅛ in.	5.07c
½ x 3/32 in.	5.77c
Tees:	
1 x ⅛ in.	4.47c
1¼ in. x 1¼ in. x 3/16 in.	4.37c
1½ to 2½ x ¼ in.	4.17c
1½ to 2½ x 3/16 in.	4.17c
3 in. and larger	4.12c

Merchant Steel

	Per lb.
Bessemer machinery	3.97c
Tire, 1½ x ½ in. and larger	3.97c
Toe calk, ½ x ⅜ in. and larger	4.72c
Open-hearth spring steel	8.00c
Standard cast steel, base price	16.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	4.27c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	5.12c
No. 10	5.17c
No. 12	5.22c
No. 14	5.27c
No. 16	5.37c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.02c	——
Nos. 22 and 24	6.07c	7.62c
No. 26	6.12c	7.67c
No. 27	6.17c	——
No. 28	6.22c	7.82c
No. 29	6.32c	——
No. 30	6.42c	——

No. 28, 36 in. wide, 10c higher.

Genuine Russia, as per assortment ..... 22½ @ 25c

Patent planished, W. Dewees Wood, A 13 to 13¼c; B 11 to 11¾c net

Galvanized

	Per lb.
No. 14	6.67c
No. 16	6.82c
Nos. 18 and 20	6.97c
Nos. 22 and 24	7.12c
No. 26	7.27c
No. 27	7.42c
No. 28	7.57c
No. 30	8.07c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Brass Tubes, Rods and Wire, and Copper Tubes

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 27c. to 29c. per lb.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.

Planished copper, 1c. per sq. ft. more than polished.

Tinning, one side, 6c. per sq. ft.

Tin Plates

Bright Tin		Coke—14x20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes / Waste
		80 lb.	$8.70 / $8.4
		90 lb.	8.80 / 8.5
		100 lb.	8.90 / 8.6
IC $11.65	$10.40	IC	9.15 / 8.9
IX 13.85	12.35	IX	10.30 / 10.0
IXX 15.60	14.10	IXX	11.45 / 11.2
IXXX 17.35	15.85	IXXX	12.60 / 12.3
IXXXX 19.10	17.60	IXXXX	13.75 / 13.5

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.8
IC	9.0
IX	10.0

Tin

Straits pig	74c to 7
Bar	85c to 9

Copper

Lake Ingot	20c to 2
Electrolytic	20c to 2
Casting	20c to 2

Spelter and Sheet Zinc

Western spelter	10c to 11
Sheet zinc, No. 9 base, casks	14c; open 14½

Lead and Solder*

American pig lead	6½ to 7
Bar lead	7½c to 8¼
Solder ½ & ½ guaranteed	4
No. 1 solder	4
Refined solder	3

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	9
Commercial grade, per lb	5

Antimony

Asiatic	10c to 11

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb	33.1
In small lots	38c to 4

Old Metals

The general tone of the market continues weak. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	14 7
Copper, heavy and wire	14.0
Copper, light and bottoms	11.5
Brass, heavy	8.5
Brass, light	7.0
Heavy machine composition	14.5
No. 1 yellow rod brass turnings	9.0
No. 1 red brass or composition turnings	12.7
Lead, heavy	4.0
Lead, tea	3.0
Zinc	4.5